BLM LIBRARY
88067234

U.S. Department of the Interior

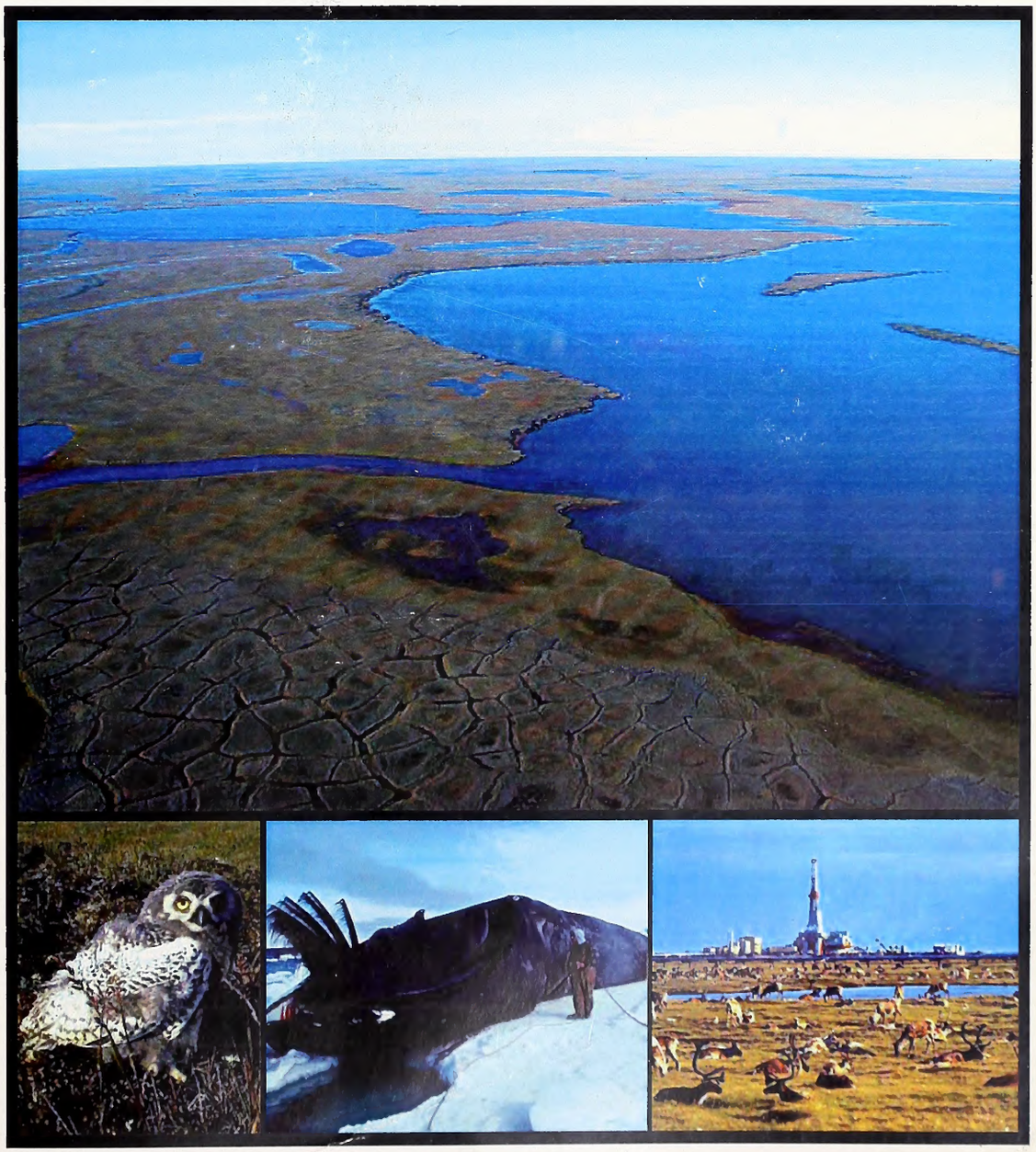
Bureau of Land Management **January 2005**

Northeast National Petroleum Reserve – Alaska

FINAL Amended Integrated Activity Plan/ Environmental Impact Statement

Volume 2

Chapter 4.7 to 4.12, Chapter 5, and Chapter 6



The BLM Today

Our Vision
To enhance the quality of life for all citizens through the balanced stewardship of America's public lands and resources.

Our Mission
To sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

Our Values
To serve with honesty, integrity, accountability, respect, courage, and commitment to make a difference.

Our Priorities
To improve the health and productivity of the land to support the BLM multiple-use mission.

To cultivate community-based conservation, citizen-centered stewardship, and partnership through consultation, cooperation, and communication.

To respect, value, and support our employees, giving them resources and opportunities to succeed.

To pursue excellence in business practices, improve accountability to stakeholders, and deliver better service to our customers.

How this EIS is Organized

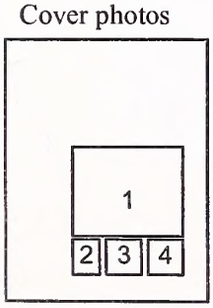
Volume 1
Abstract
Executive Summary
Chapter 1 Introduction
Chapter 2 Alternatives
Chapter 3 Affected Environment
Chapter 4 Environmental Consequences (Sections 4.1 to 4.6)

Volume 2
Chapter 4 Environmental Consequences (Sections 4.7 to 4.12)
Chapter 5 Consultation and Coordination
Chapter 6 Comments

Volume 3
Appendices
Maps
References
Glossary
Index

BLM/AK/PL-05/006+1610+930

Cover photos



1. Lake Teshekpuk (Bureau of Land Management and Craig McCaa)
2. Snowy owl chick (Craig George, North Slope Borough, Department of Wildlife Management)
3. Whale harvest (Craig George, North Slope Borough, Department of Wildlife Management)
4. Drill rig and caribou herd (BP Exploration (Alaska), Inc.)

#57674112
ID 88067234
HD
243
.A4
N67
2005
v.2
c.2

Final

Amendment to the Northeast National Petroleum Reserve Integrated Activity Plan/ Environmental Impact Statement

Volume 2

Chapter 4: Environmental Consequences (Sections 4.7 to 4.12)
Chapter 5: Consultation and Coordination
Chapter 6: Response to Public Comments

Prepared by

U.S. Department of the Interior, Bureau of Land Management
Anchorage, Alaska

January 2005

Volume 2

TABLE OF CONTENTS AND LISTS OF TABLES, FIGURES, AND MAPS

TABLE OF CONTENTS

VOLUME 2

4.7 Effects of the Cumulative Case 4-417
4.7.1 Structure of the Cumulative Impacts Analysis 4-417
4.7.2 Activities Not Associated with Oil and Gas Exploration and Development Considered in the Cumulative Effects Analysis 4-420
4.7.3 Oil and Gas Exploration and Development Activities Considered in the Cumulative Effects Analysis 4-425
4.7.4 Advances in Technology 4-454
4.7.5 Resource Protection Measures Considered in the Cumulative Effects Analysis 4-468
4.7.6 Other Information Considered in the Cumulative Effects Analysis 4-470
4.7.7 Analysis of Cumulative Effects by Resources 4-471
4.7.8 Incremental Contribution of Alternatives to Cumulative Effects 4-588
4.7.9 Cumulative Effects Outside of the Planning Area from the Transport of Northeast National Petroleum Reserve – Alaska Produced Oil 4-589
4.8 Unavoidable Adverse Effects 4-590
4.8.1 Air Quality 4-590
4.8.2 Paleontological Resources 4-591
4.8.3 Soil Resources 4-591
4.8.4 Water Resources 4-591
4.8.5 Vegetation 4-591
4.8.6 Wetlands and Floodplains 4-592
4.8.7 Fish 4-592
4.8.8 Birds 4-592
4.8.9 Mammals 4-593
4.8.10 Threatened and Endangered Species 4-593
4.8.11 Cultural Resources 4-594
4.8.12 Subsistence 4-594
4.8.13 Sociocultural Systems 4-595
4.8.14 Environmental Justice 4-595
4.8.15 Coastal Zone Management 4-595
4.8.16 Recreation Resources 4-595
4.8.17 Visual Resources 4-596
4.8.18 Economy 4-596
4.9 Relationship Between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity 4-596
4.9.1 Air Quality 4-596
4.9.2 Paleontological Resources 4-596
4.9.3 Soil Resources 4-597
4.9.4 Water Resources 4-597
4.9.5 Vegetation 4-597
4.9.6 Wetlands and Floodplains 4-598
4.9.7 Fish 4-598
4.9.8 Birds 4-598
4.9.9 Mammals 4-598
4.9.10 Threatened and Endangered Species 4-599
4.9.11 Cultural Resources 4-599
4.9.12 Subsistence 4-600

4.9.13 Sociocultural Systems 4-600
4.9.14 Environmental Justice 4-600
4.9.15 Coastal Zone Management 4-600
4.9.16 Recreation Resources 4-600
4.9.17 Visual Resources 4-601
4.9.18 Economy 4-601
4.10 Irreversible and Irretrievable Commitment of Resources 4-601
4.10.1 Air Quality 4-601
4.10.2 Paleontological Resources 4-601
4.10.3 Soil Resources 4-602
4.10.4 Water Resources 4-602
4.10.5 Vegetation 4-602
4.10.6 Wetland and Floodplains 4-602
4.10.7 Fish 4-602
4.10.8 Birds 4-603
4.10.9 Mammals 4-603
4.10.10 Threatened and Endangered Species 4-603
4.10.11 Cultural Resources 4-603
4.10.12 Subsistence 4-604
4.10.13 Sociocultural Systems 4-604
4.10.14 Environmental Justice 4-604
4.10.15 Coastal Zone Management 4-604
4.10.16 Recreation Resources 4-605
4.10.17 Visual Resources 4-605
4.10.18 Economy 4-605
4.10.19 Oil and Gas Resources 4-605
4.11 Low-Probability, Very Large Oil Spill 4-605
4.11.1 Introduction 4-605
4.11.2 Blowout Assumptions 4-607
4.11.3 Behavior and Fate of a Blowout Oil Spill During Various Seasons 4-608
4.11.4 Effects of a Low-Probability, Very Large Oil Spill 4-609
4.11.5 Comparison of Alternatives 4-619
4.11 Possible But Unlikely Permanent Roads 4-620
4.12.1 Scenario for a Possible Permanent Road Within the Planning Area 4-620
4.12.2 Scenario for a Possible Permanent Road Connecting Northeast National Petroleum Reserve – Alaska to Outside of the Planning Area 4-621
4.12.3 Effects 4-621

Chapter 5. Consultation and Coordination 5-1
5.1 Preview of this Section 5-3
5.2 Formal Scoping 5-3
5.3 Agency and Organization Meetings 5-3
5.4 Agencies and Organizations Contacted 5-4
5.5 Government-to-Government Consultation 5-5
5.6 Public Review and Comment on the Draft Amended IAP/EIS 5-7
5.7 Development of the Final Preferred Alternative 5-7
5.8 List of Preparers of the Draft IAP/EIS 5-8

Chapter 6. Comments and Responses 6-1
6.1 Summary of Comments on the Draft Amended IAP/EIS 6-3
6.2 Commenting Agencies, Organizations, and Individuals 6-4
6.2.1 Written Comments 6-4
6.2.2 Public Meeting Testimony 6-6
6.3 General Comments and Responses 6-10
6.4 Specific Comments and Responses 6-12

List of Tables

4-28 Physical Size of the North Slope Villages Considered in the Cumulative Effects Analysis 4-422
4-29 Population of North Slope Villages within the Cumulative Effects Analysis Area 4-422
4-30 DEW-Line Sites Constructed on the North Slope of Alaska 4-423
4-31 Oil Exploration and Development on the North Slope 4-426
4-22 Past, Present, and Reasonably Foreseeable Oil and Gas Development on the North Slope 4-437
4-22 North Slope Oil Infrastructure (1968-2001) 4-440
4-23 Gas Resource Estimates for Each Alternative 4-448
4-24 Summary of Reserve and Resource Estimates Used in the Cumulative Analysis 4-450
4-25 Production, Reserves, and Resource Estimates Used in the Cumulative Analysis 4-451
4-26 Past, Present, and Reasonably Foreseeable Future Production and Development Total Disturbed Acres for the North Slope 4-462
4-27 Summary of Traditional Knowledge/Local Knowledge 4-545

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

Sections 4.7 – 4.12

TABLE OF CONTENTS

Page

4.7 Effects of the Cumulative Case 4-417
4.7.1 Structure of the Cumulative Impacts Analysis 4-417
4.7.1.1 Class of Actions Whose Affects are to be Analyzed 4-417
4.7.1.2 Appropriate Temporal and Spatial Domain 4-418
4.7.1.3 Set of Receptors to be Assessed 4-419
4.7.1.4 Magnitude of Effects and Whether Those Effects are Accumulating 4-419
4.7.2 Activities Not Associated with Oil and Gas Exploration and Development Considered in the Cumulative Effects Analysis 4-420
4.7.2.1 North Slope Development 4-421
4.7.3 Oil and Gas Exploration and Development Activities Considered in the Cumulative Effects Analysis 4-425
4.7.3.1 Past Exploration, Development, and Production on the North Slope and in the Planning Area 4-425
4.7.3.2 Present Development and Production on the North Slope and in the Planning Area (2005-2008) 4-441
4.7.3.3 Reasonably Foreseeable Future Development and Production (Within the Next 20 Years) 4-442
4.7.3.4 Speculative Development (Beyond 20 Years) 4-443
4.7.3.5 Oil Production on the North Slope of Alaska 4-448
4.7.3.6 State Lease Sales Considered in This Cumulative Effects Analysis 4-449
4.7.3.7 Federal Lease Sales Considered in This Cumulative Effects Analysis 4-450
4.7.3.8 Infrastructure and Transportation 4-451
4.7.4 Advances in Technology 4-454
4.7.4.1 Seismic/Off-road Travel/Exploration 4-455
4.7.4.2 Drilling and Completion Technologies 4-458
4.7.4.3 Development and Production 4-460
4.7.4.4 Abandonment and Restoration 4-464
4.7.4.5 Global Climate Change 4-467
4.7.5 Resource Protection Measures Considered in the Cumulative Effects Analysis 4-468
4.7.5.1 Air Quality 4-469
4.7.5.2 Water Quality 4-469
4.7.5.3 Wetlands and Floodplains 4-469
4.7.5.4 Essential Fish Habitat 4-469
4.7.5.5 Caribou 4-469
4.7.5.6 Marine Mammals 4-469
4.7.5.7 Threatened and Endangered Species 4-470
4.7.5.8 Environmental Justice 4-470
4.7.5.9 Consultation and Coordination with Indian Tribal Governments 4-470
4.7.6 Other Information Considered in Cumulative Effects Analysis 4-470
4.7.7 Analysis of Cumulative Effects By Resources 4-471
4.7.7.1 Air Quality 4-471
4.7.7.2 Paleontological Resources 4-474
4.7.7.3 Soil Resources 4-477
4.7.7.4 Water Resources 4-481
4.7.7.5 Vegetation 4-487
4.7.7.6 Wetlands and Floodplains 4-492
4.7.7.7 Fish 4-496
4.7.7.8 Birds 4-503
4.7.7.9 Mammals 4-512
4.7.7.10 Threatened and Endangered Species 4-525

4.7.7.11 Cultural Resources 4-538
4.7.7.12 Subsistence 4-542
4.7.7.13 Sociocultural Systems 4-557
4.7.7.14 Environmental Justice 4-562
4.7.7.15 Coastal Zone Management 4-566
4.7.7.16 Recreational Resources 4-573
4.7.7.17 Visual Resources 4-576
4.7.7.18 Economy 580
4.7.8 Incremental Contribution of Alternatives to Cumulative Effects 4-588
4.7.9 Cumulative Effects Outside of the Planning Area from the Transport of Northeast National Petroleum Reserve – Alaska Produced Oil 4-589
4.8 Unavoidable Adverse Effects 4-590
4.8.1 Air Quality 4-590
4.8.2 Paleontological Resources 4-591
4.8.3 Soil Resources 4-591
4.8.4 Water Resources 4-591
4.8.5 Vegetation 4-592
4.8.6 Wetlands and Floodplains 4-592
4.8.7 Fish 4-592
4.8.7.1 Freshwater and Anadromous/Amphidromous Fish 4-592
4.8.7.2 Marine Fish 4-592
4.8.8 Birds 4-592
4.8.9 Mammals 4-593
4.8.9.1 Terrestrial Mammals 4-593
4.8.9.2 Marine Mammals 4-593
4.8.10 Threatened and Endangered Species 4-593
4.8.11 Cultural Resources 4-594
4.8.12 Subsistence 4-594
4.8.13 Sociocultural Systems 4-595
4.8.14 Environmental Justice 4-595
4.8.15 Coastal Zone Management 4-595
4.8.16 Recreation Resources 4-595
4.8.17 Visual Resources 4-596
4.8.18 Economy 4-596
4.9 Relationship Between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity 4-596
4.9.1 Air Quality 4-596
4.9.2 Paleontological Resources 4-596
4.9.3 Soil Resources 4-597
4.9.4 Water Resources 4-597
4.9.5 Vegetation 4-597
4.9.6 Wetlands and Floodplains 4-598
4.9.7 Fish 4-598
4.9.7.1 Freshwater and Anadromous/Amphidromous Fish 4-598
4.9.7.2 Marine Fish 4-598
4.9.8 Birds 4-598
4.9.9 Mammals 4-598
4.9.9.1 Terrestrial Mammals 4-598
4.9.9.2 Marine Mammals 4-599
4.9.10 Threatened and Endangered Species 4-599
4.9.11 Cultural Resources 4-599
4.9.12 Subsistence 4-600
4.9.13 Sociocultural Systems 4-600

4.9.14 Environmental Justice 4-600
4.9.15 Coastal Zone Management 4-600
4.9.16 Recreation Resources 4-600
4.9.17 Visual Resources 4-601
4.9.18 Economy 4-601
4.10 Irreversible and Irretrievable Commitment of Resources 4-601
4.10.1 Air Quality 4-601
4.10.2 Paleontological Resources 4-601
4.10.3 Soil Resources 4-602
4.10.4 Water Resources 4-602
4.10.5 Vegetation 4-602
4.10.6 Wetland and Floodplains 4-602
4.10.7 Fish 4-602
4.10.7.1 Freshwater and Anadromous/Amphidromous Fish 4-602
4.10.7.2 Marine Fish 4-602
4.10.8 Birds 4-603
4.10.9 Mammals 4-603
4.10.9.1 Terrestrial Mammals 4-603
4.10.9.2 Marine Mammals 4-603
4.10.10 Threatened and Endangered Species 4-603
4.10.11 Cultural Resources 4-603
4.10.12 Subsistence 4-604
4.10.13 Sociocultural Systems 4-604
4.10.14 Environmental Justice 4-604
4.10.15 Coastal Zone Management 4-604
4.10.16 Recreation Resources 4-605
4.10.17 Visual Resources 4-605
4.10.18 Economy 4-605
4.10.19 Oil and Gas Resources 4-605
4.11 Low-Probability, Very Large Oil Spill 4-605
4.11.1 Introduction 4-605
4.11.1.1 Well Control Incidents 4-606
4.11.2 Blowout Assumptions 4-607
4.11.3 Behavior and Fate of a Blowout Oil Spill During Various Seasons 4-608
4.11.3.1 Winter 4-608
4.11.3.2 Fall Freezeup 4-608
4.11.3.3 Spring Breakup 4-609
4.11.3.4 Summer 4-609
4.11.4 Effects of a Low-Probability, Very Large Oil Spill 4-609
4.11.4.1 Air Quality 4-609
4.11.4.2 Paleontological Resources 4-609
4.11.4.3 Soil Resources 4-609
4.11.4.4 Water Resources 4-610
4.11.4.5 Vegetation 4-610
4.11.4.6 Wetlands and Floodplains 4-610
4.11.4.7 Fish 4-611
4.11.4.8 Birds 4-611
4.11.4.9 Mammals 4-613
4.11.4.10 Threatened and Endangered Species 4-614
4.11.4.11 Cultural Resources 4-616
4.11.4.12 Subsistence 4-616
4.11.4.13 Sociocultural Systems 4-617
4.11.4.14 Environmental Justice 4-617

4.11.4.15 Coastal Zone Management 4-618
4.11.4.16 Recreation Resources 4-618
4.11.4.17 Visual Resources 4-618
4.11.4.18 Economy 4-618
4.11.5 Comparison of Alternatives 4-619
4.12 Possible Permanent Roads 4-620
4.12.1 Scenario for a Possible Permanent Road Within the Planning Area 4-620
4.12.2 Scenario for a Possible Permanent Road Connecting Northeast National Petroleum Reserve – Alaska to Outside of the Planning Area 4-621
4.12.3 Effects 4-621
4.12.3.1 Air Quality 4-621
4.12.3.2 Paleontological Resources 4-621
4.12.3.3 Soil Resources 4-622
4.12.3.4 Water Resources 4-622
4.12.3.5 Vegetation 4-623
4.12.3.6 Wetlands and Floodplains 4-623
4.12.3.7 Fish 4-624
4.12.3.8 Birds 4-624
4.12.3.9 Mammals 4-625
4.12.3.10 Threatened and Endangered Species 4-626
4.12.3.11 Cultural Resources 4-626
4.12.3.12 Subsistence 4-627
4.12.3.13 Sociocultural Systems 4-629
4.12.3.14 Environmental Justice 4-630
4.12.3.15 Coastal Zone Management 4-630
4.12.3.16 Recreation Resources 4-631
4.12.3.17 Visual Resources 4-631
4.12.3.18 Economy 4-632

List of Tables

4-28 Physical Size of the North Slope Villages Considered in the Cumulative Effects Analysis 4-422
4-29 Population of North Slope Villages within the Cumulative Effects Analysis Area 4-422
4-30 DEW-Line Sites Constructed on the North Slope of Alaska 4-423
4-31 Oil Exploration and Development on the North Slope 4-426
4-32. Past, Present, and Reasonably Foreseeable Oil and Gas Development on the North Slope. 4-437
4-33. North Slope Oil Infrastructure (1968-2001). 4-440
4-34. Gas Resource Estimates for Each Alternative. 4-448
4-35. Summary of Reserve and Resource Estimates Used in the Cumulative Analysis. 4-450
4-36. Production, Reserves, and Resource Estimates Used in the Cumulative Analysis. 4-451
4-37. Past, Present, and Reasonably Foreseeable Future Production and Development Total Disturbed Areas for the North Slope (in acres) 4-462
4-38 Summary of Traditional Knowledge/Local Knowledge. 4-545

CHAPTER 4 (Cont.)

ENVIRONMENTAL CONSEQUENCES

4.7 Effects of the Cumulative Case

The National Environmental Policy Act and its implementing guidelines require an assessment of the proposed project and other projects that have occurred in the past, are occurring in the present, or are likely to occur in the future, which together may have cumulative impacts that go beyond the impacts of the proposed project itself. According to the Act (40 CFR §1508.7 and 1508.25[a][2]):

> "Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In addition, to determine the scope of environmental impact statements, agencies shall consider cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.

The purpose of this cumulative effects analysis is to determine if the effects of non-oil and gas activities, and oil and gas activities, on the North Slope, including proposed actions in the Planning Area, have the potential to interact or accumulate over time and space, either through repetition or combined with other effects, and under what circumstances and to what degree they might accumulate (NRC 2003).

4.7.1 Structure of the Cumulative Impacts Analysis

For this amendment, the analysis of cumulative impacts is a four-step process that follows guidance provided in *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997) and *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope* (NRC 2003):

1. Specify the class of actions whose affects are to be analyzed;
2. Designate the appropriate time and space domain in which the relevant actions occur;
3. Identify and characterize the set of receptors to be assessed; and
4. Determine the magnitude of effects on the receptors and whether those effects are accumulating.

4.7.1.1 Class of Actions Whose Affects are to be Analyzed

Both non-oil and gas activities and oil and gas activities, advances in technology, and climate change are considered in the analysis. The assumptions and scenarios used by the resource specialists in the analyses of the cumulative impacts include those identified for the Planning Area in Section 4.2 (Introduction and Basic Assumptions for the Environmental Consequences Assessment).

Non-Oil and Gas Activities

Non-oil and gas activities include those activities that have occurred in the past, are presently occurring, or are likely to occur in the future. These include activities discussed in Section 4.2.1.1, Activities Not Associated with Oil and Gas Exploration and Development, that could occur within and outside of the Planning Area, and other

North Slope activities, including resettlement and expansion of Native villages, and other residential, commercial, and industrial development on the North Slope, and military (DEW-Line) and other government sites.

Oil and Gas Activities

Oil and gas activities include those direct and indirect activities that have occurred in the past, are presently occurring, or are likely to occur in the future. These include activities discussed in Section 4.2.1.2, Oil and Gas Exploration and Development, that could occur within the Planning Area and on the North Slope. The activities likely to have the greatest effects vary by resource. For example, oil and gas activities considered in greatest detail in the cumulative impacts analysis for biological resources are:

- Exploration activities, including seismic activities, off-road travel, and exploration drilling
- Road construction (ice, peat, and gravel roads)
- Industrial activity (oil field development and production and related infrastructure)
- Oil spills
- Marine-related activities
- Site reclamation

In contrast, employment and income are important activities to consider when evaluating the economy. Activities analyzed for each resource are identified in Section 4.7.7, Analysis of Cumulative Effects By Resources.

Advances in Technology

Over the past 2 decades, new technologies have been developed and applied to exploration, development, and production on the North Slope. Some technologies, such as the use of ice roads and ice pads for exploration wells and the Arctic Drilling Platform, are unique to the Arctic and were largely developed in Alaska. Other advances, such as the use of coiled tubing, 3-D seismic-data acquisition, horizontal and multilateral drilling, measurement while drilling, low ground-pressure vehicles (Rolligons), and remote sensing were developed elsewhere. These technologies have been important in reducing cumulative effects to resources from oil and gas activities and are discussed in more detail in Section 4.7.4, Advances in Technology.

Global Climate Change

This amendment also considers the effects of global climate change in assessing cumulative effects. The effects of past, current, and future activities on the North Slope could be much greater on the permafrost landscape than would be the case if the climate were relatively stable. While impacts of global climate change are likely to be most evident in the Arctic, the causes of global climate change and the contribution of emissions from fossil fuels to those causes are global in scope. Consequently, North Slope oil and gas activities need to be viewed in that context. Although activities associated with exploration, development, and production of oil and gas resources on the North Slope, and the burning of petroleum resources discovered on the North Slope, will produce some greenhouse gases, their contribution to global climate change is negligible as the North Slope provides only a small fraction of all fossil hydrocarbons burned on earth (NRC 2003).

4.7.1.2 Appropriate Temporal and Spatial Domain

Temporal Domain

The analysis period covered by the cumulative effects analysis begins in 1900, when first exploration on the North Slope began, and continues through 2100. The ending date is based on the assumption that oil and gas fields will be discovered and developed in the Planning Area during the next 20 years, that exploration and development activities that could occur more than 20 years from now, and that production and abandonment activities could last for 50 years after initial discoveries are made. Due to the difficulty of predicting advances in technology and the need for oil and gas very far into the future, however, a more reasonable analysis period, and one on which most of

the cumulative effects analysis is focused, is 50 years into the future. For discussion purposes, this period has been further broken down into four analysis periods.

1. Past exploration, development, and production (activities and infrastructure associated with existing operations on the North Slope);

2. Present exploration, development, and production (activities and infrastructure associated with existing operations on the North Slope that may be currently underway or planned by 2008);

3. Reasonably foreseeable future development (oil and gas discoveries or other projects that are clearly identified and are expected to initiate development-related activities [site surveys, permitting, appraisal drilling, or construction]) within the next 20 years; and

4. Speculative development (discoveries that could be made and possibly developed beyond a 20-year timeframe, and discoveries with low commercial potential).

Spatial Domain

For individual resources and uses, the area of which an effect could be felt could be the "footprint," but for others the effect may extend well beyond that space. For example, noise effects to wildlife can extend miles beyond the footprint of the development. For purposes of this analysis and based on guidance in NRC (2003), the spatial domain for past, present, and reasonably foreseeable activities is primarily the North Slope of Alaska and its adjacent marine waters. However, this amendment also considers effects to resources that could occur outside of Alaska and its adjacent marine waters, primarily to migratory birds and mammals.

The main area of development on the North Slope is centered on the Prudhoe Bay – Kuparuk complex. The outliers of development are represented by the Alpine oil field just to the east of the Planning Area, the Northstar field offshore in the Beaufort Sea, and the Badami field (now shut-in) to the east of Prudhoe Bay. This development area encompasses an area approximately 120 to 130 miles east to west and ranging from 10 to 20 miles inland from the Beaufort Sea coastline and 5 miles offshore. The Alpine Satellite Development would extend the area of oil production to the west approximately 20 miles and in from the coastline up to 40 miles. To form a context for the proportional size of the development area, the North Slope (including the general area north of the Brooks Range) is a regional area of approximately 55,000 square miles (including the Arctic National Wildlife Refuge), with 650 miles of coastline. The oil development area (not including the TAPS corridor) is an area of approximately 3,000 square miles, with a coastline of approximately 230 miles. Thus, existing and planned oil development spans approximately 5 percent of the land area and 35 percent of the coastline of the North Slope. It should be noted that a description of the proportional area of development does not ascribe a specific level of cumulative impact to resources.

4.7.1.3 Set of Receptors to be Assessed

The set of receptors assessed in the cumulative effects analysis are the physical, biological, and human systems discussed in Chapter 3 (Affected Environment). The analysis of cumulative effects is most readily accomplished if good baseline data are available. Lack of good data or missing information makes assessing cumulative effects more difficult.

4.7.1.4 Magnitude of Effects and Whether Those Effects are Accumulating

The potential extent of the total cumulative effects (e.g., number of animals and habitat affected, jobs and revenues created or lost), and how long the effects might last (e.g., population recovery time, duration of income flows) are estimated to determine the magnitude of effects that could accumulate for each resource. Where possible, the assessment of effects on a resource is based on quantitative analysis (e.g., number of miles of gravel roads

constructed; number of animals killed). However, many effects are difficult to quantify (e.g., animal behaviors; human perceptions) and a qualitative assessment of effects is made.

As suggested by the CEQ (1997) handbook, *Considering Cumulative Effects Under the National Environmental Policy Act*, this amendment considers the following basic types of effects that might occur:

- "Additive" (total loss of sensitive resources from more than one incident),
- "Countervailing" (negative effects are compensated for by beneficial effects), and
- "Synergistic" (total effect is greater than the sum of the effects taken independently).

The purpose of the analysis of cumulative effects in this amendment is to determine whether the effects are additive or synergistic or have some other relationship. Additive (or combined) effects on specific resources often are difficult to detect and do not necessarily add up in the strict sense of one plus one equals two. It is much more likely that an additive or combined effect would be greater than one but less than two. A synergistic effect, in theory, is a total effect that is greater than the sum of the additive effects on a resource. To arrive at a synergistic effect in this example (continuing with the numeric analogy), the total cumulative effect would need to end up greater than two. In the highly variable Arctic environment, where natural variations in population levels can exceed the impacts of human activity, such an effect would need to be much greater than the hypothetical two to be either measurable or noteworthy. A countervailing effect occurs when an impact has both negative and beneficial effects. For example, the removal of gravel from mines destroys vegetation and wildlife habitat (negative effect), but often leads to the creation of deep-water pools that are important to overwintering fish (positive effect).

In the analyses that follows, effects should be considered to be additive in nature, unless otherwise noted. While synergistic impacts have been demonstrated in the laboratory (for certain types of chemical reactions, for example), there is almost no evidence of such impacts occurring when dealing with biological resources in the Arctic environment. Where synergistic impacts are not specifically accounted for in the analysis section, it is because there are neither studies nor information supporting the identification of such impacts. Resource analysts have striven to keep the cumulative analysis useful, manageable, and concentrated on meaningful potential effects. The cumulative analysis considers in greatest detail activities that are more certain to happen and that are geographically in or near the Planning Area, and activities identified during scoping as being of greatest concern. Where possible, guiding principles from existing standards, criteria, and policies that control management of the natural resources of concern have been used to help focus the analysis. Where existing standards, criteria, and policies are not available, the resource experts used their best judgment on where and how to focus the analysis.

4.7.2 Activities Not Associated with Oil and Gas Exploration and Development Considered in the Cumulative Effects Analysis

In addition to oil and gas development, other reasonably foreseeable future actions were identified that would occur on the North Slope. These activities include continued human activities such as sport and subsistence hunting and fishing, commercial fishing, tourism, recreational activities. These are discussed in Section 4.2.1.1 (Activities Not Associated with Oil and Gas Exploration and Development). Other non-oil and gas activities that could occur on the North Slope include construction of a road between the Planning Area and Dalton Highway and/or Kuparuk River Unit, and growth and development associated with villages and military sites on the North Slope. The cumulative effects associated with a proposed road to the Planning Area are discussed in Section 4.12 (Possible Permanent Roads). The history of non-oil and gas development is discussed below, and the effects from past and future non-oil and gas development discussed in Section 4.7.7 (Analysis of Cumulative Effects by Resources).

4.7.2.1 North Slope Development

North Slope Development

There are presently seven North Slope villages being considered for this analysis: Point Lay, Wainwright, Atqasuk, Barrow, Nuiqsut, Anaktuvuk Pass, and Kaktovik. While a number of these locations were occupied at various times throughout the human history on the North Slope, much of the occupation prior to 1900 consisted of seasonal dwellings. These villages have been established or reestablished since 1900, and the establishment and subsequent growth represent cumulative impact to the North Slope environment. Villages consist of dwellings and other buildings, sewage and water systems, gravel roads, gravel airstrips/airports, and other structures. Their establishment, current area, and population growth are described below (Table 4-28 and Table 4-29).

The village of Point Lay has not been incorporated under State law as a municipality, but has been incorporated as a Native Village under the Indian Reorganization Act by the Bureau of Indian Affairs. In 2003, the village had a population of 260 residents and approximately 86 percent were Iñupiat Eskimos. The village has gravel roads and an airstrip, cultural center, school, health clinic, police and fire stations, and local store. Transportation to the village is provided by scheduled airline and charter service at the local airport.

Wainwright was established in 1904 when an Alaska Native Service built a school there. The community was incorporated as a second-class city in 1962. Wainwright is currently the third largest village in the NSB with a population in 2003 of 556. The village has gravel roads and an airstrip, cultural center, school, health clinic, police and fire stations, and local store. Transportation to the village is provided by scheduled airline and charter service at the local airport.

The village of Atqasuk is at a site that has historically been the location of dwellings. Coal was mined in the community, then known as Meade River, in World War II and freighted to Barrow. The population dwindled in the 1960s but the village was re-established in the 1970s under the name Atqasuk, and incorporated as a second class city in 1982. Atqasuk had a population of 250 residents in 2003, 91 percent of whom were Iñupiat Eskimos. The village has a public electricity system, a school, police and fire stations, airstrip, health clinic, and local store. About 85 percent of households have water piped to their house. Transportation to the village is provided by scheduled airline and charter service at the local airport.

Nuiqsut was established in 1974 when 27 families moved to the present location. The new residents lived in a tent city for 18 months before permanent housing could be built. The village was incorporated as a second-class city in 1975. In 2003, there were 416 residents in the village; about 92 percent were Iñupiat. The village has a school, health clinic, store, police and fire station, and public transportation system. All but one of the Nuiqsut households had running water in 2003. The village has a public utility (electricity) system. Transportation to the village is provided by scheduled airline and charter service at the local airport.

Barrow is the economic, transportation, and administrative center for the NSB and the largest community, with a population in 2003 of 4,429. The city was incorporated as a first class city in 1959. Most Barrow homes are heated by natural gas from nearby gas fields. Utilities are available through Barrow Utilities and Electric Cooperative. The community has schools including a community college, stores, hotels, police and fire stations, and a bank. Transportation to and from Barrow is provided by the Wiley Post – Will Rogers Regional Airport, including jet service.

The village of Anaktuvuk Pass was settled in the 1940s. The inland Nunamiut Eskimos were nomadic and largely vacated the Brooks Range area in the early 1900s due to a collapse in the caribou populations. By the 1940s, several Nunamiut families returned to the area and settled at the present village site. The community was incorporated as a second-class city in 1957. In 2003, the population of Anaktuvuk Pass was about 329, of which approximately 88 percent were Iñupiat. The village has a school and health clinic. In 2003, approximately 90 percent of the households had running water and flush toilets. Transportation to the village is provided by scheduled airline and charter service at the local airport.

The village of Kaktovik was incorporated as a second-class city in 1971. The village has a school, police and fire stations, water and sewer systems, a local store, and health clinic. The NSB provides trash and sewage pick-up. Transportation to the village is provided by scheduled airline and charter service at the local airport.

Military Development and DEW-Line Stations

The DEW-Line is an integrated chain of radar and communications sites stretching across Alaska, Northern Canada and Greenland. The DEW Line was initiated in 1954 when President Eisenhower signed a bill approving construction. Their purpose was to detect any incoming, over-the-pole, aircraft invasions emanating from the Soviet Union. Actual construction took place between 1955 and 1957 and the system was declared operational on July 31, 1957. A total of 58 sites were constructed; 22 of them were in Alaska, of these 14 were located along the coast of the North Slope (Table 4-30).

Table 4-28. Physical Size of the North Slope Villages Considered in the Cumulative Effects Analysis.

Village	City Limits (acres)	Tracts (acres)
Kaktovik	620	149
Anaktuvuk Pass	3,302	373
Nuiqsut	5,760	649
Atqasuk	27,353	328
Barrow	13,866	3,028
Wainwright	9,222	1,022
Point Lay	Not Incorporated	1,576
Total	60,123	7,128

Table 4-29. Population of North Slope Villages within the Cumulative Effects Analysis Area.

Village	1939	1950	1973	1980	1988	1990	1993	1998	2003
Kaktovik	13	46	144	165	227	224	230	256	284
Anaktuvuk Pass	NA	66	134	203	264	259	270	314	329
Nuiqsut	89	NA	128	208	314	354	418	420	416
Atqasuk	78	49	NA	107	219	216	237	224	250
Barrow	363	951	2,167	2,267	3,335	3,469	3,908	4,641	4,429
Wainwright	341	227	353	405	514	492	584	649	556
Point Lay	117	75	31	68	132	139	192	246	260
Total	1,001	1,414	2,957	3,423	5,005	5,153	5,839	6,750	6,524
NA – Not available.									

Each DEW-Line site consisted of a gravel runway and road system, permanent housing, water and fuel storage tanks with pads, heating plants, and (petroleum/oil/lubricant [POL] and water) pipelines, garages, towers, and antennae. Military and civilian airlifts, sealifts during the summer, and cat trains distributed the materials to construct the permanent facilities. Land within the sites varied from 100 to 2,830 acres. There were three general types of stations, main stations (see Site Number column in Table 4-30), intermediate stations, and auxiliary stations. Main stations were larger and had more facilities and larger staff. Gravel runways were 5,000 feet (by 142 feet) long at main stations, 3,000 feet long at auxiliary stations, and 1,000 feet long at intermediate stations. During operation, auxiliary sites had staffs of about 25 persons each, but main stations had 225 to 250 employees. Intermediate stations were not manned.

The DEW-Line program was discontinued in 1963. Most intermediate DEW-Line sites were closed at that time but were generally not restored until the late 1990s. The remaining stations (main and auxiliary DEW-Line stations) were subsequently converted to support the newer Northern Warning System (NWS) established in 1985. Alternating stations along the coastline were converted to long range (LRR) and short range radar (SRR) sites, respectively. The LRR stations were in operation by 1990, followed by the SRR stations in 1994. The LRR and

SSR stations are still operating as of 2004. Some of these stations are stilled manned, but most were automated in the 1990s.

Abandonment, conversion, and automation left the stations with unused facilities. Clean-up and restoration of the stations occurred in the late 1990s and continues today. Many of the sites had contaminated soils or expected contamination consisting of petroleum, lubricants, PCBs, and insecticides, along with considerable volumes of debris and general refuse.

Table 4-30. DEW-Line Sites Constructed on the North Slope of Alaska.

Site Name	Site Number[1]	Size (acres)	Present Status[2]	Current Operation[3]	NWS Established[4]
Point Lay	LIZ-2 (aux)	2,835	LRR	manned	1989/1990
Icy Cape	LIZ-B (int)	218	Closed	abandoned	NA [5]
Wainwright	LIZ-3 (aux)	ND[6]	SRR	automated	1994
Peard Bay	LIZ-C (int)	1,460	Closed	abandoned	NA
Point Barrow	POW-Main	268	LRR	manned	1989/1990
Cape Simpson	POW-A (int)	ND	closed	abandoned	NA
Lonely	POW-1 (aux)	2,830	SRR	automated	1994
Kogru	POW-B (int)	150	closed	abandoned	NA
Oliktok	POW-2 (aux)	2,325	LRR	manned	1989/1990
Pt. McIntyre	POW-C (int)	ND	closed	ND	NA
Flaxman Island	POW-3 (aux)	620	SRR	automated	1994
Brownlow Point	POW-D (int)	ND	closed	abandoned	NA
Barter Island	BAR-Main	4,500	LRR	ND	1990
Demarcation Bay	BAR-A (int)	100 ac	closed	abandoned	NA

[1] Main = Main station; aux = auxiliary station; and int = intermediate station.
[2] LRR = Long Range Radar site, and SRR = Short Range Radar site.
[3] Current operations are manned, operational but automated, or abandoned – not in operation.
[4] Date Northern Warning System operations began at site.
[5] NA = Not applicable (station closed, not converted to NWS).
[6] ND = Not determined.

Site clean-up of the Icy Cape Intermediate DEW-Line site was conducted in 1997 and included removal of two 20,000-gallon and six 300-gallon oil storage tanks, 800 feet of POL pipeline, a fuel pumping station, more than forty 55-gallon POL drums, a 240-feet unmarked tower, and 1,500 cubic yards of contaminated gravel fill. Soil sampling for potential PCB-contamination was conducted on the site in 2003. Future planned restoration activities include analyzing PCB soil test samples.

A Remedial Investigation and Feasibility Study (RI/FS) was conducted and identified six Installation Remedial Program sites at the Wainwright DEW-Line Station. The RI/FS determined the source and size of each of the Installation Remedial Program sites. Building Demolition and Debris Removal (BD/DR) activities are planned for 2008-2009.

Site clean-up (restoration) of the Peard Bay Intermediate DEW-Line site was conducted in 1997 and included the removal of a fuel pumping station, a 240-feet unmarked tower, and approximately 1,000 cubic yards of contaminated gravel fill on 5 acres. Soil sampling for additional petroleum-contamination and potential PCB-contamination was conducted on the site in 2003.

The DEW-Line Station at Point Barrow has three Installation Restoration Program Sites which are scheduled for environmental restoration beginning in 2008-2009.

Site clean-up of the Cape Simpson Bay Intermediate DEW-line site was conducted in 1998, and included removal of 12 (four 20,000-gallon and eight 300-gallon) oil storage tanks, two 1,000-gallon propane tanks, a fuel pumping station, 25 batteries, buildings, a 240-feet unmarked tower, POL-contaminated soil, a contaminated gravel fill, and POL-contaminated surface water.

Based upon historical usage and prior sampling events, 10 environmental impacted sites within the former Point Lonely DEW-line station have been identified as Areas of Concern. Major chemicals of concern are POL, PCB, general refuse, and insecticides.

Site clean-up of the Kogru Intermediate DEW-line site was conducted in 1996 and included removal of eight 300-gallon oil storage tanks and more than sixty 55-gallon POL drums. Additional soil sampling was conducted in the field to verify there is not petroleum or PCB contamination.

Seven environmentally impacted areas have been identified at the Oliktok DEW-Line Station. These areas are scheduled for restoration activities under Project Clean Sweep in 2007-2008. Major environmental concerns that have been identified at these areas are POL, PCB, general refuse, and insecticides.

Five environmental areas of concern, within the former Flaxman Island DEW-Line station, have been identified with possible POL, PCB, and general refuse contamination. Project Clean Sweep has scheduled major BD/DR activities at these sites for 2008-2009.

The Barter Island DEW-line station consists of 14 determined Installation Restoration Program sites. The U.S. Air Force's (611 Civil Engineering Squadron) Project Clean Sweep has scheduled major BD/DR activities for 2008-2009. Building/structure demolition and disposal and environmental background sampling are currently being conducted.

The Brownlow Point Intermediate DEW-Line site is currently abandoned. Most of the site has eroded into the Beaufort Sea. Site clean-up (restoration) conducted at the Brownlow Point site included the removal of one 25-feet by 80-feet unsafe building and more than 500 POL 55-gallon drums scattered over 10 acres. Due to low priority, no work is scheduled in the next 2 years. An associated 456-acre portion of the Brownlow Point site, known as Collinson Point, underwent initial site-cleanup (restoration) in 1994 and final clean-up in 2000. Removed from the site were 11 300-gallon to 550-gallon oil storage tanks, a fuel pumping station, a fuel pipeline, approximately 1,500 55-gallon POL drums, five buildings, a contaminated gravel fill, and adjacent POL-contaminated soil. Planned future environmental activities include additional site visits to determine if contamination has been cleaned up so the site can be closed.

Site clean-up (restoration) of the Demarcation Bay (Nuvagapak Point) Intermediate DEW-Line site was conducted in 1994 and again (final clean-up) in 2000, and included removal of 19 oil storage tanks, 3,000 feet of petroleum/oil/lubricant pipeline, a fuel pumping station, five buildings, and more than 7,000 55-gallon POL drums. Additional soil sampling for petroleum and potential PCB contamination was conducted in 2003.

Restoration has taken place at Manning Point. This 10-acre site served as a staging area for the Barter Island DEW-Line station from 1952 to 1957, after which there was no follow-up use of the land. Restoration included removal of more than 10,000 55-gallon POL drums, 5 tons of combustible debris, and 25 tons of noncombustible debris. Planned future environmental activities include collection and analysis of additional soil samples so the site can be closed.

Griffen Point served as a staging area for several DEW-Line stations from 1953 to 1957. The site is currently abandoned. Restoration activities have included removal of more than 1,000 55-galllon POL drums scattered along 5 miles of the Arctic Ocean frontage.

4.7.3 Oil and Gas Exploration and Development Activities Considered in the Cumulative Effects Analysis

This section discusses the history and projects the future of development in the region by identifying past, ongoing, and reasonably foreseeable oil and gas activities in the Planning Area and elsewhere on the North Slope. Oil and gas development is the main agent of industrial change on the North Slope. Oil and gas exploration and production activities have occurred on the North Slope since the early 1900s and production has occurred for more than 50 years. Associated industrial development has included the creation of an industry support community airfield at Deadhorse and an interconnected industrial infrastructure that includes roadways, pipelines, production and processing facilities, gravel mines, and docks. In 1977, the TAPS began to transport North Slope crude oil to a year-round marine terminal in Valdez, Alaska. Today, it continues to transport the North Slope's entire production, and it is projected to do so for many years into the future.

For this analysis, oil and gas scenarios were developed based on estimates of future activities. The scenarios are conceptual views of the future that include the timing and extent of future petroleum activities in the Beaufort Sea and on the North Slope. Estimates of anticipated production consider many factors, including the economically recoverable resources of the area, past industry leasing and exploration efforts, and future economic conditions.

For this cumulative analysis, oil and gas activities are divided into the following categories:

- Past Exploration, Development, and Production: Exploration, development, and production activities and associated infrastructure for past, present, and future operations on the North Slope. This category involves construction and ongoing maintenance of present infrastructure, including support facilities and transportation systems.
- Present Exploration, Development, and Production: Exploration, development and production activities that may be currently under construction or approved for construction in the near future (by 2008). This category includes other non-oil-field development, including support and transportation components.
- Reasonably Foreseeable Future Exploration, Development, and Production: Oil and gas discoveries, or other projects, that are identified by location and are expected to initiate development-related activities (e.g., site surveys, permitting, appraisal drilling, or construction) within the next 20 years.
- Speculative Development: Potential petroleum resources and projects that could be developed beyond a 20-year timeframe. The timing and location of these discoveries and projects cannot be established, so a detailed analysis is not possible at this time.

4.7.3.1 Past Exploration, Development, and Production on the North Slope and in the Planning Area

The North Slope of Alaska is a very sparsely populated region of extreme climate, with abundant energy and other natural resources. Exploration and industrial development for extraction of the mineral resources of the region (principally oil and gas), which has been active over the past 80 years, is the primary man-induced change to the North Slope (Table 4-31).

During the 80-year oil and gas exploration period, the most intense development activity occurred during the 1970s and early 1980s. It was during this period that the Prudhoe Bay and Kuparuk oil fields were developed, TAPS and the haul road were constructed, and a large portion of the roads, drilling pads, gravel sources, collector pipelines, and production facilities were built. It was also a period of much activity in the National Petroleum Reserve – Alaska, with thousands of miles of seismic lines surveyed and dozens of exploratory wells drilled. Since then, additional development has occurred, but incremental physical disturbance to the environment has been reduced.

Table 4-31. Oil Exploration and Development on the North Slope.

Date	Event
Before Recorded History	Visible oil seepages used by Native inhabitants of the North Slope.
1882	U.S. government representatives hear of oil seepages while traveling in the area.
1886	First non-Natives see seepages at Cape Simpson.
1901	Peters and Schrader traverse the Brooks Range and North Slope recording the geology and geography of the region.
1906-1914	E. Leffingwell mapped the Arctic Coast east of Barrow and much of the area that now comprises the Arctic National Wildlife Refuge.
1909	First description of Cape Simpson deposits published.
1914	First oil-related claim staked.
1921	Additional claims staked by individuals and industry.
1921	Large deposits of oil discovered in Oklahoma and Texas and industry loses interest in the remote Arctic.
1922	First industry-sponsored geological investigation of North Slope oil potential.
1923	Naval Petroleum Reserve No. 4 (PET-4) established.
1923-1926	First analysis of PET-4 potential.
1943	Territory of Alaska Bureau of Mines sends field party to the North Slope to investigate oil and gas seepages.
1944	Start of PET-4 petroleum exploration program; PET-4 headquarters established at Barrow; land north of the drainage divide of the Brooks Range withdrawn from pubic entry by the Secretary of the Interior; and Public Land Order 82.
1945	Thirty-one shallow core tests drilled at Cape Simpson and oil was produced.
1945-1952	Numerous geophysical studies conducted across PET-4 find oil and gas.
1947	Office of Naval Research establishes Arctic Research Laboratory.
1949	High sulfur, heavy oil found at a test well drilled near Fish Creek, and gas discovered near Barrow.
1953-1968	Federal geologic field studies continue in PET-4 and several major oil companies begin exploration.
1957	Oil discovered in Cook Inlet (south-central Alaska).
1958	Public Land Order 82 modified; federal leasing begins on the North Slope; first industry-sponsored geological field programs; and Alaska Statehood Act passed.
1959	Alaska becomes the 49th state in the Union.
1962	First industry-sponsored seismic program.
1963-1967	First industry exploration well drilled on the North Slope; 11 unsuccessful wells drilled; and industry interest in the North Slope wanes.
1964	First State of Alaska lease sale on the North Slope.
1965	Area that eventually includes Prudhoe Bay leased.
1967	Initial exploratory drilling at sites that would become Prudhoe Bay field.
1968	ARCO announces the discovery of Prudhoe Bay oil field, the largest in North America.
1969	Kuparuk, West Sak, and Milne Point fields discovered; Alaska State Lease Sale No. 23 held; and federal lease sales suspended on the North Slope for the next 10 years because the Secretary of the Interior imposed freezes due to Native claims.
1970	National Environmental Policy Act signed into law.
1971	Alaska Native Claims Settlement Act passed.
1974-1976	Federally-sponsored exploration along the Barrow Arch.
1976	PET-4 transferred from the Navy to the Department of the Interior and renamed the National Petroleum Reserve – Alaska; sale of crude oil from Petroleum Reserves 1, 2, and 3 authorized; and major exploration effort launched by the USGS in the National Petroleum Reserve – Alaska.
1977	Trans-Alaska Pipeline System operational.
1979	Initial leasing of portions of the state and federal OCS waters of the Beaufort Sea.

Table 4-31. Oil Exploration and Development on the North Slope (Cont.).

Date	Event
1980	Alaska National Interests Land Conservation Act passed.
1981	First OCS exploration well drilled.
1982	Initial leasing of portions of the National Petroleum Reserve – Alaska.
1984-1985	Seismic exploration of the Arctic National Wildlife Refuge 1002 Area conducted.
1985	First industry exploration well drilled in the National Petroleum Reserve – Alaska.
1986	Arctic Slope Regional Corporation well drilled within the coastal plain of the Arctic National Wildlife Refuge.
Various times	Initial leasing of portions of Arctic Slope Regional Corporation lands.
Early 1990s	Last of the National Petroleum Reserve-Alaska leases from the initial leasing program are relinquished.
1994	Discovery of the Alpine field.
1998	Northeast National Petroleum Reserve – Alaska IAP/EIS ROD signed.
1999	Lease sale held in Northeast National Petroleum Reserve – Alaska.
2000	Alpine production begins.
2001	Northstar field begins production; development of Liberty field suspended; Phillips (successor of ARCO) announces discoveries in National Petroleum Reserve – Alaska.
2002	Lease sale held in Northeast National Petroleum Reserve – Alaska.
2003	Beaufort Sea Sale 186 held.
2004	Northwest National Petroleum Reserve – Alaska IAP/EIS ROD signed.
2004	Lease sales held in Northwest National Petroleum Reserve – Alaska.
2004	Alpine Satellite Development Plan EIS ROD signed.
Source: NRC (2003) and USDOI BLM (2004a).	

More recent fields have generally been developed in areas adjacent to existing producing areas, reducing the amount of additional support infrastructure (roads, pipelines, and processing facilities) needed to support additional production. At the same time, changes and improvements in technology have generally decreased the physical disturbance caused by more recent exploration, development, and production activities.

The Native population of the North Slope has established seven large communities from Kaktovik in the east to Point Hope in the west, and numerous smaller settlements for temporary occupancy. From these settlements, hunting and fishing areas (traditional subsistence use areas) extend across the landscape and coastal waters of the Chukchi and Beaufort seas. Of the four communities in proximity to the Planning Area, only Nuiqsut is (or will soon be) surrounded by oil development. Barrow, the largest village on the North Slope, is approximately 130 miles from Prudhoe Bay. The area of proposed oil leasing lies between the subsistence use areas of Barrow and Nuiqsut.

With expansion of the Alpine oil field, Nuiqsut will have oil field development extending farther into its subsistence use area. As future oil field development occurs in the Planning Area, the other North Slope communities would have oil field development closer to their villages, with an increasing likelihood of interaction between industrial activities and their subsistence use areas

The following section discusses the history of exploration and development on the North Slope, and is summarized from information in NRC (2003) and in the *Geology and Exploration of the National Petroleum Reserve – Alaska, 1974 to 1982* (Gryc 1988).

Pre-1900s

Oil seepages that are seen today along the Arctic Coast, from Skull Cliff on the Chukchi Sea to Brownlow Point on the Beaufort Sea, were the first evidences of potentially significant petroleum deposits on the North Slope of Alaska. Especially important were the active ponds of oil and layers of tar at Cape Simpson, just east of Barrow,

likely known to the native inhabitants long before recorded history. In 1881-1883, John Murdoch, a member of the U.S. Navy's International Polar Expedition, visited Point Barrow and vicinity, and in 1892 reported that the expedition heard stories of a lake of tar on an island a 1 day sail east of Point Barrow, most likely Camp Simpson (Murdoch 1892). In August of 1886, the first non-native people to see the Cape Simpson seepages could have been Charles Brower and his partner Patrick Grey while on a hunting trip (Brower 1942). The North Slope's potential as a significant oil province was further shown when Ensign W.L. Howard found a pebble-sized piece of oil shale along the Etivuluk River in 1886 (Smith and Mertie 1930).

1900 to 1940

In 1904, W. Peters and F. Schrader, a topographer and a geologist, published the first recorded systematic geologic and geographic traverse of the Brooks Range and the North Slope (Schrader and Peters 1904). In 1901, the researchers traveled by way of the John, Anaktuvuk, and the Colville rivers, naming and describing the Lisburne Formation of the Mississippian age and the Cretaceous rocks in the area. They noted the anticlinal structures in the foothills of the Brooks Range and numerous coal seams along the Colville and Anaktuvuk rivers. They also described the coal exposures along the northwest coast, which were mined by Alaska natives and whalers for many years.

From 1906 to 1914, E. Leffingwell mapped the Arctic Coast east of Barrow and much of the inland area of what is now the Arctic National Wildlife Refuge (Leffingwell 1919). He described and named the rock formations that were later discovered as the oil-bearing rocks at Prudhoe Bay and noted the seepages at Cape Simpson. He concluded that, "Even if an oil pool were found in the northern region, there is serious doubt of its availability under present conditions, though it might be regarded as a part of the ultimate oil reserves that would some time be developed."

From 1909 to 1921, individuals and industry representatives staked claims, under the old mining laws, at Cape Simpson, Peard Bay, and along the Meade, Kukpowruk, and Kokolik rivers. During that time, large deposits of oil were discovered in Oklahoma and Texas and industry shifted their interest to those new places of production rather than the North Slope (Van Valin 1941).

About 1920, the U.S. Navy began to convert their engines from coal to oil, and an oil shortage was already being predicted. In 1923, in order to provide for the increased oil needs, the Naval Petroleum Reserve No. 4 (PET-4) was established by Executive Order No. 3797-1. The early reporting of oil seepages at Cape Simpson, Ensign Howard's discovery of oil shale along the Etivuluk River, the description of resources found in the North Slope by Peters and Schrader, and Leffingwell's mapping of the area, were all used to decide on the borders of PET-4. However, the geology and the geography of the PET-4 interior areas were still largely unknown, and it was necessary to increase the level of mapping and data gathering on the area.

From 1923 through 1926, USGS parties crossed the Brooks Range and PET-4 and mapped the geology and geography along many of the larger rivers, including the Kuk and Utukok rivers in the west and the Etivuluk, Killik, and Colville rivers in the east (Smith and Mertie 1930).

The USGS team, P. Smith and J. Mertie, also analyzed the petroleum potential of the Reserve. They concluded that the best possible sources of petroleum were in the apparently widespread oil shales, while the sources of oil in the Paleozoic rocks were problematic. They did not believe the Cretaceous rocks held much potential for petroleum, as they thought the rocks were small and sparse. Additionally, they concluded that the Cretaceous source rock in the Brooks Range was too deep for practicable drilling. They recommended that evaluating the petroleum potential in the PET-4 would be best realized by drilling for stratigraphic and structural information near Cape Simpson, and then by pursuing additional geologic field studies and drilling in other favorable areas.

1940 – 1968

Government-Sponsored Exploration and Development Activities

In 1943, the Bureau of Mines sent a field party to the North Slope to investigate oil and gas seepages, in response to inquires from the Alaska Defense Command and Territory of Alaska officials. The field party examined and sampled the Cape Simpson seepages, as well as several additional sites along the Arctic Coast. Samples were collected from 12 separate sites, and seepages were confirmed along Skull Cliff, Dease Inlet, Cape Simpson, Fish Creek, Brownlow Point, Manning Point, and Umiat Mountain.

In 1944, the first modern program of exploration, drilling, and geophysical and geological surveys was started by the U.S. Navy, and USGS geologic traverses began along the Colville River, later expanding to all major north-flowing rivers of the North Slope. In 1946, overland travel was necessary for the detailed structural geologic mapping. Weasels, military-style tracked vehicles were used to cross the Brooks Range by four different routes, covering much of interior area of the PET-4. By 1950, almost every stream capable of floating by boat was also traversed. Helicopters were first used for geologic studies in the Anaktuvuk Pass area; aerial photographs of over 70,000 square miles of the PET-4 and adjacent areas helped geologists interpret the possible geologic structure of the area, and a special series of photos were also used to analyze and plan field surveys by the USGS.

Between 1945 and 1952, geophysical studies, including experimental airborne magnetometer and gravity and seismic surveys, were completed and covered a large part of the Reserve. The seismic surveys covered about 67,000 square miles, which included areas outside of PET-4, the gravity-meter surveys covered about 26,000 square miles, and the airborne magnetometer surveys covered 75,000 square miles, nearly all of the ACP and much of the foothills of the North Slope. Travel and housing of the geophysical crews was by tractor-sled trains, smaller tracked vehicles, and small aircraft.

In 1944, the first drilling locations were determined by the presence of the seepages at Cape Simpson and a reconnaissance of the Umiat Anticline. It was decided that drilling should be limited to depths less than 10,000 feet, thought to be the economic limit at the time. In February and March of 1945, supplies were sledded to Umiat, where a drilling and logistic support camp was established and drilling began. The Umiat oil field, however, was not discovered until 1950, and still remains undeveloped. However, Umiat is still an important operating base for air transportation and geophysical and geological operations.

Also in 1945, 31 shallow core tests were drilled at Cape Simpson. Oil was produced, but the estimated reserves were considered too small to justify additional development. By 1948, geophysical surveys indicated the presence of a large basement high under the Barrow high and led to drilling near the top of the high. Gas was discovered, but neither oil nor hard rock basement was found at a depth of 2,500 feet. This area is now referred to as the Barrow Arch, the north limb of the Colville Basin.

In 1949, high sulfur, heavy oil was found at a test well drilled near the Fish Creek seepage at a depth of 3,000 feet. However, no structure was found and no reserve estimate was made, and continued geophysical exploration around the Barrow high found no significant oil reserves. Given the discovery of oil at Umiat, and the mapping of several closed anticlinal structures in and adjacent to PET-4, it was thought that further potential was in the northern foothills. Therefore, 10 shallow test holes were drilled on 6 structures; 1 gas field and 3 prospective gas fields were discovered; and 2 closed structures were mapped in the western part of PET-4. Test wells were drilled, one, Meade, of which showed strong gas, and one, Kaolak, of which was dry.

From 1945 through 1952, 45 core tests and 36 well tests were drilled within and adjacent to PET-4. The results showed one large oil field, Umiat, one large gas field, Gubik, one small gas field, Barrow, three prospective gas fields, Mead, Square Lake, and Wolf Creek, and two small oil deposits, at Cape Simpson and Fish Creek.

In 1947, the U.S. Navy, Bureau of Yard Docks, established and developed a research facility in the Seabee (Navy Construction Battalion) detachment, at Barrow. This was an important development for the Barrow community and for the exploration and development of the North Slope petroleum reserves. By May of 1947, a building program

began to provide housing and laboratory facilities for the Arctic Research Laboratory (ARL), Office of Naval Research (ONR), and in August of 1947, ONR occupied these new facilities. To more fully acknowledge the U.S. Navy's contribution to Arctic research, ARL became the Naval ARL (NARL) in the mid-1960s.

In 1949, the discovery of gas at Barrow was likely the most significant result of the PET-4 project to the people of Barrow. The South Field is the oldest producing gas field in Alaska and the South and East Gas fields are the farthest north producing oil or gas fields in North America. When the PET-4 project arrived in 1944, Barrow was home to about 400 inhabitants; the exploration activities provided employment opportunities for the local people and the population quickly increased.

In 1953, the PET-4 program was unexpectedly halted. By then, additional drill sites had been selected and supplies had started to arrive at a location east of PET-4, in the southern foothills near the head of the Shaviovik River and at another location at the head of the Utukok River in the southwest corner of the Reserve. Most of the supplies were later returned to Barrow and Umiat.

In 1964, Congress granted permission to extend the gas supply to Barrow, and the village was completely converted to natural gas by 1965. The gas was supplied by the U.S. Navy at a subsidized cost and use was unlimited, which the Barrow community was dependent on for heat and power.

After the PET-4 program was recessed in 1953, the entire camp facility was turned over to ONR until December 1954, when the Air Force took over the management of the base camp to support the DEW-Line program. The Air Force continued to operate the base camp through civilian contractors until October 1971, when the operation was returned to the U.S. Navy. During that period, ONR continued to manage the laboratory through a contract with the University of Alaska.

In 1980, the NARL was decommissioned and the camp and all facilities were turned over to the USDOI. From 1980 through 1984, the laboratory and camp facilities were managed by the USGS and their contractor, primarily as a base of operation for the Barrow Gas Fields. In 1984, NARL and the base facilities were tuned over to the local native corporation, Ukpeagvik Iñupiat Corporation (UIC).

State and Federal Leasing and Industry-Sponsored Exploration Activities

In the mid- to late 1950's and early 1960s, a number of factors led to the beginning of industry actively exploring the North Slope for oil and gas resources. Although industry was aware of and interested in the North Slope, the lack of land availability, remoteness, and high costs associated with operating in the area precluded industry participation.

The factors that contributed to the entry of industry into the North Slope exploration scene were an overall encouragement of regional geological studies, the PET-4 program, the discovery of commercial quantities of oil and gas in Cook Inlet, and the end of the land availability moratorium on the North Slope, the latter of which was likely the most important factor in attracting industry to the area. The oil and gas found in the Cook Inlet demonstrated that it was economically feasible to explore for, develop, and sell hydrocarbons in and from Alaska. In 1957, ARCO made the initial discovery of Alaskan oil at Swanson River, on the Kenai Peninsula, which contributed significantly to Alaska statehood in 1959 and provided incentive to industry for the exploration of other sedimentary basins in the state.

After the federal government's decision, through the BLM, to make lands available for leasing, a total of 18,862 leases were offered in sales held in 1958, 1964, 1965, and 1966 (Jamison et al. 1980). Most of the sales were to the east and southeast of PET-4, however the lease sale in 1966 contained 3,022,716 acres to the west of PET-4.

In addition to the federal government lease sales, the State of Alaska selected 1,616,745 acres across the northern tier between the Colville and Canning rivers, to be offered for lease between 1964 and 1967. In 1964, the State's first lease sale on the North Slope offered 650,000 acres in the Colville River Delta area, and 196 tracts totaling

about 475,000 acres were leased. In 1965, the State's second North Slope lease sale offered 754,000 acres, and 151 tracts totaling 380,000 acres were leased. Richfield-Humble acquired 28 blocks on what is now the crest of the Prudhoe Bay oil field, and British Petroleum acquired 32 blocks on the flanks. During the third State lease sale, in 1967, Richfield-Humble acquired 7 of the 13 tracts offered and leased; the 7 tracts covered the remainder of the crestal area of the Prudhoe Bay field.

In 1958, Sinclair operated a 3-month field program out of Umiat in preparation for the federal lease sale that year. In order to gain a better understanding of the subsurface geology and the hydrocarbon potential of the region, many companies began to gather geological data during summer field programs and geophysical, primarily seismic, during winter seismic operations. Following Sinclair, an average of five to seven companies were in the field during the 1959 through 1961 seasons, and up to 10 companies per year were operating geological field programs from 1962 through 1964. Field programs began to decline after 1964 and only two or three companies were in the field per year.

In 1962, Sinclair and BP operated the first industry program, with the first seismic season consisting of about 6.5 crew-months. The crew-months grew to about 29 in 1963, peaked at about 53 in 1964, and decreased to about 27 in 1965. There was little seismic acquisition between 1965 and 1968, until the season following the Prudhoe Bay discovery (discussed below).

In 1963, industry began exploratory drilling, based on leasing, geologic field work, and seismic acquisition. A total of 11 dry wells were drilled between 1963 and 1968. Colorado Oil and Gas Company drilled the first well in the Gubik area, followed by seven other dry wells, all of which were drilled on leases acquired in the first round of federal lease sales. The wells were located in the foothills, within 30 miles of either the Umiat or Gubik discoveries, near the areas that had shown the most promise during the Navy's previous exploration efforts.

After the initial failure of the drilling programs in the Umiat-Gubik area, industry shifted efforts to the north and east areas of the North Slope. During 1966 and 1967, Sinclair and Union each drilled a well on the eastern flank of the Colville High; both wells were dry. During the same period, ARCO-Humble drilled another dry well, Susie No. 1, in the northern foothills of the Brooks Range. The decision was made to take the rig 60 miles north to drill in the Prudhoe Bay area, rather than releasing the rig and ceasing any further drilling.

In April of 1967, drilling began for Prudhoe Bay State No. 1. In January of 1968, ARCO-Humble announced the discovery of oil and gas with a recoverable economic reserve estimate of 9.6 Bbbl of oil and 26 Tcf of gas.

At this time, there were little to no geologic and seismic programs on the North Slope and, other than Prudhoe Bay State No. 1, all drilling activity had ceased. However, with the discovery at Prudhoe Bay, and the State's announcement for an additional lease sale in the fall of 1969, industry substantially increased the level of exploration activities on the North Slope. The geological and geophysical programs surpassed the 1967 levels to 12 geological crew-months and 24 seismic acquisition crew-months in 1968 and 20 and 97 crew-months, respectively, in 1969 (Jamison et al. 1980). Additionally, in 1969, several other oil accumulations were discovered: the Kuparuk, West Sak, and Milne Point fields.

In September of 1969, the Alaska State Competitive Lease Sale No. 23 was held, offering 179 tracts totaling 450,858 acres—the unleased portion of the State's 1,600,000-acre allotment for the Statehood Act. With an average price per lease of $2,181.66 per acre, high bids on the 164 of the 179 tracts totaled more than $900,000,000. This was the last sale on the North Slope for 10 years (ADNR 2001a).

1969-2004

Between 1969 and 1979, there were no additional lease sales held on the North Slope or the adjacent waters of the Beaufort Sea, making land accessibility the limiting factor for industry activity. Beginning in 1979, however, the shallow State waters and federal OCS areas of the Beaufort Sea were made available through a series of lease sales, and additional onshore sales were held in the Colville-Canning area. The State offered 71 tracts (341,140 acres)

and granted leases on 62 tracts (296,308 acres). This sale marked the first major venture into offshore leasing in the Arctic by either the State or federal governments.

In the 1980s, 1999, 2002, and 2004, the federal government, through the BLM, opened portions of the National Petroleum Reserve – Alaska to leasing. Although there are Native inholdings, and a land trade with Native corporations was considered in the mid-1980s, the Arctic National Wildlife Refuge has never been opened for leasing. Also, at various times, the ASRC made portions of their lands available to companies under exclusive exploration/leasing agreements.

Table 4-32 lists the discoveries, date of initial production, and 2003 production and reserves for oil and gas fields on the North Slope. Individual oil pools have been developed together as fields that share common wells, production pads, and pipelines. Fields have been grouped into participating areas (or production units) sharing common infrastructure, such as processing facilities, roads, and pipeline systems. Table 4-33 provides information on the existing infrastructure. A map showing the location of these developments and the general infrastructure interconnecting them is shown in Map 3-3. All of these fields, with the exception of Northstar, Endicott, Sag Delta North, and Eider, are onshore on state leases. The Niakuk, Point McIntyre, and Badami oil pools are mainly offshore, but are produced from onshore sites. If the Point Thomson field, which is included in the list of future projects, is developed, it is expected that the proposed Point Thomson pipeline would tie into Badami's common-carrier pipeline.

The following discussion of the post-Prudhoe Bay activity focuses on four geographic areas that have different degrees of accessibility and economics. These are the Colville-Canning area/shallow State waters, the Beaufort Sea OCS, National Petroleum Reserve - Alaska, and the 1002 Area of the Arctic National Wildlife Refuge. The onshore areas frequently contain some combination of state/Native or federal/Native land ownership.

Colville-Canning Area/Beaufort Sea State Waters

Through the 1970s, the area between the Colville and Canning rivers, from the Beaufort Sea south to the Brooks Range, was the sole area of industry exploration on the North Slope. Because of limited land availability and the success at and near Prudhoe Bay, this area has been the focus of exploration activity since the discovery well was drilled in 1968. The bulk of exploration and drilling has been concentrated in the northern portion of the area, near Prudhoe Bay and east and west along the coastline, following the structural trend of the Barrow Arch. The State leasing program that began in 1979, in the shallow state waters of the Beaufort Sea, is generally confined to a 3-mile-wide strip seaward from the shoreline and from Barrow to the Canadian border. The issue of ownership becomes somewhat irregular in the vicinity of the barrier islands and major inlets.

Seismic activity was at a high in 1970 with 96 crew-months. This decreased to 8 crew-months in 1972, and then grew back to 54 crew months in 1974. Following the high level of activity generated by the Prudhoe Bay discovery, geological and geophysical crew activity decreased sharply in the early 1970s and then slowly increased and stabilized by the late 1970s. In the early 1970s, geological field programs averaged about 20 crew-months per year. By 1974, this decreased to 6 crew-months and averaged 5 to 6 crew-months through the remainder of the 1970s (Jamison et al. 1980). During the 1980s and 1990s, the amount of fieldwork varied considerably, but the activity never reached the levels seen in the 1960s and 1970s. Over the last decade, geological activity has averaged 1 to 3 crew-months per year. Unlike seismic acquisition and exploration drilling, geological field activity frequently takes place external to the principal area of exploration interest. Much of the fieldwork was carried out in the Brooks Range to the south and in the Sadlerochit and Shublik Mountains of the Arctic National Wildlife Refuge.

Seismic activity was at a high in 1970 with 96 crew-months, decreased to 8 crew-months in 1972, and grew back to 54 crew-months in 1974 (Jamison et al. 1980). In the late 1970s, seismic activity averaged about 25 crew-months per year. Since 1980, the level of seismic acquisition has varied, but likely averaged less than 20 crew-months per year. One of the major reasons for this decrease has been the departure of several companies and the merger of former competitors. Also, the existing regional seismic grid was found to be of sufficient quality to allow

companies to more finely tune their seismic acquisition and focus on specific areas. The more recent seismic acquisitions tend to be 3-D programs that provide a more detailed image of the subsurface than do the 2-D surveys. Seismic 3-D programs are too costly to be acquired on a truly regional scale and are generally limited to a maximum of 500 to 600 square miles.

From 1970 to the present, there have been 35 discoveries on state lands (ADNR 2001b). These range from the currently uneconomic Kavik (discovered in 1969) and Kemik (discovered in 1972) gas fields in the east-central portion of the Colville-Canning province to large oil discoveries at Endicott (discovered in 1978) and Alpine field (discovered in 1994). A significant undeveloped resource is the Point Thomson oilfield (discovered 1977)[1]. The field is located just to the west of the mouth of the Canning River and contains reserves estimated at 5 Tcf of gas and 360 MMbbl of oil.

Twenty of the 35 discoveries are either developed and on production, or are currently being developed (i.e., Northstar, located offshore). At least seven or eight of the discoveries are satellite fields and would not have been developed if they were not adjacent to a large field with an existing infrastructure. Tabasco and the Midnight Sun/Sambuca fields are satellites, each of which has oil reserves of 30 to 70 MMbbl.

The most recent fields to be developed in this region are associated with the Alpine oil field. The Alpine oil field encompasses approximately 890,000 acres of federal, state, and private lands in the central ACP of the North Slope. This area includes the Colville River Delta and the portions of the Tingmiaksiqvik River, Judy Creek, Fish Creek, Kalikpik River, and Kogru River drainages in the easternmost part of the Planning Area. During 1996, ARCO announced that the Alpine Prospect in the Colville River Delta was producible and contained an estimated 365 MMbbl of oil. More recent estimates of Alpine oil field reserves, however, are near 500 MMbbl. In November of 2000, production began in the Alpine field and approximately 105,000 bbls of oil are produced per day; there are plans to expand the facilities to handle up to 140,000 bbls of oil per day.

Alpine field oil reserves are extracted from two production pads (called CD-1 and CD-2) that are connected by a 3-mile long road and an oil processing facility has been constructed at CD-1. Infrastructure at the existing CD-1 pad fully supports the ongoing drilling and production operations, including activities at the CD-2 site. Facilities and equipment currently installed include processing facilities, production wells, camp facilities, sanitation utilities (water and wastewater), a drilling mud plant, an airstrip, a maintenance complex, warehouse buildings, disposal wells, an emergency response center, and communications, power generation, and various mobile equipment (USDOI BLM 2004c). Oil is transported through a 34-mile pipeline to a CPF in the Kuparuk River Unit, where Alpine field oil production is commingled with that of other fields in the area. Alpine field oil is then transported via the main Kuparuk River Unit pipeline to Pump Station 1 of TAPS. The Alpine oil field pipeline to the Kuparuk River Unit crosses under the Colville River channel. Ice roads and bridges provide access during the winter; otherwise there are no overland routes to this isolated field. There are no gravel roads connecting the road system in Kuparuk River Unit to the Alpine oil field. The footprint of the Alpine oil field infrastructure, excluding the pipeline to the Kuparuk River Unit, is approximately 100 acres.

Since the first commercial discovery at Prudhoe Bay in 1968, a total of 39 discoveries have been made on State leases and 24, nearly all in the immediate Prudhoe-Kuparuk area, were or are being developed. This area has been, and will continue to be, the primary exploration grounds until or unless large, attractive areas of the National Petroleum Reserve - Alaska and/or the Arctic National Wildlife Refuge become available for leasing.

[1] It is worth noting that in the 2000 State lease sale, one of the bidding groups acquired a substantial tract of leases in the Kavik-Kemik area. They picked up all of the leases, except those held by the discovery wells, which had been surrendered by previous lessees. The possibility of a gas pipeline from the North Slope has changed the perception of those discoveries. The wining companies are betting that the gas reserves are larger than previously estimated.

Federal OCS and Beaufort Sea

The Beaufort OCS lands were unavailable to industry until the joint State of Alaska/federal lease sale of 1979, which, along with subsequent sales, provided access to waters beyond the 3-mile limit, stretching from Point Barrow in the west to the Canadian border in the east. Including the 1979 lease sales, the Beaufort OCS has been the site of eight lease sales over a 20-year period. The most recent sale was held in 2003 (ADNR 200la, USDOI MMS 2001b). Over 720 leases have been issued in the Beaufort Sea, totaling 3.7 million acres.

The data acquisition issue is somewhat different in the case of the OCS regions. There is little or no geologic field work conducted exclusively for the purposes of developing a better understanding of the offshore subsurface geology. Rather, the subsurface well control from onshore drilling activities and secondarily outcrop geology is tied into the seismic grids to extend the geologic interpretations into the offshore areas and assist in the definition of potential prospects.

Seismic acquisition in the OCS is not well documented; however, commencing in the mid- to late 1970s, both summer marine and winter ice programs were acquired to correlate the better explored and understood onshore geology into the Beaufort Sea. Most, if not all, of the existing seismic data are 2-D, with little if any 3-D acquisition outside of the areas of existing discoveries or prospects that are being prepared for drilling within the next few seasons. While the per season or total line miles are not known, the totals are easily in excess of 5,000 line-miles.

The existing seismic grid extends across state waters and ties into onshore wells or wells in the shallow near-shore portions of the Beaufort Sea. The acquisition area extends from near Point Barrow on the west to near the Canada border on the east.

The first OCS exploration well was the Beethy Point No.1 in 1981, and the most recent exploration well was the Warthog No. 1 in 1997. The peak of exploration drilling was in 1985 through 1986, when 11 of the 30 exploration wells were drilled. A secondary drilling mode occurred during 1991 through 1993, when seven wells were drilled. In 1997, two exploration wells were drilled, the only since 1993 (USDOI MMS 2001b). Phillips Alaska, Inc., planned to drill an exploration well on its McCovey Prospect in 2001, but was unable to drill the well because of permitting problems.

Depending on water depth, the OCS exploration wells are either drilled from man-made ice islands or large, heavy, bottom-anchored, ice-resistant drilling rigs. If a discovery is made and the field developed, a more permanent structure is built to provide the base for long-term operations.

Eleven of the OCS exploration wells are determined to be capable of production (USDOI MMS 2001b). Of these, five are termed significant discoveries, of which four are in the OCS waters: Tern/Liberty (discovered in 1983), Hammerhead (discovered in 1985), Sandpiper (discovered in 1986), and Kuvlum (discovered in 1992). The fifth well is the Northstar field (Seal well), which underlies both federal and state acreage (ADNR 2000, USDOI MMS 2001b).

Tern/Liberty, Sandpiper, and Northstar lie offshore from the well-established Kuparuk and Prudhoe Bay fields and their infrastructure. The Hammerhead and Kuvlum discoveries are well to the east of the Prudhoe Bay field, in relatively deep water. Hammerhead is offshore from the Point Thomson and Flaxman discoveries. The Kuvlum discovery is to the east of the Canning River and offshore from the 1002 Area of the Arctic National Wildlife Refuge. The Northstar field has been developed and began production in late 2001.

National Petroleum Reserve – Alaska

In 1974, the high prices of oil and the discovery of oil at Prudhoe Bay renewed interest in PET-4, later renamed the National Petroleum Reserve – Alaska. The U.S. Navy began a small exploratory program, and in 1975, the Navy awarded a 5-year contract to Husky Oil, Inc., to manage and conduct a full-scale petroleum exploration program in

PET-4. The focus of the exploration work was in the northeastern portion of the Reserve where it was believed that it would be most likely to encounter an extension of the Prudhoe Bay productive zones.

In 1976, the Reserve was renamed the National Petroleum Reserve – Alaska, oversight of the Reserve was transferred from the Navy to the USDOI, and the USGS was assigned several tasks, including (1) continuing the program of exploration begun by the Navy, (2) continuing operation and management of the Barrow gas fields, and (3) completing the cleanup program, begun by the Navy, of the Reserve and adjacent areas. Between 1974 and 1982, 28 test wells were drilled, and although indications of oil or gas were found in nearly all of the test wells, no deposits were found that warranted development. In addition, six exploratory and development wells were drilled in the Barrow area to supplement the local gas supply. Exploratory drilling by the USGS ended in 1981 when the National Petroleum Reserve – Alaska was opened up to leasing.

Nearly 15,000 miles of seismic survey was completed and interpreted between 1974 and 1982. Seismic activities covered 1,440 miles in 1976. In 1977, seismic surveys covered approximately 1,500 miles, primarily in the Foothills Province; this area and the Brooks Range were again explored in 1978 when 1,916 miles were surveyed. In 1979, 1,900 miles of seismic survey was obtained, including use of the Vibroseis method, rather than explosives. Much of the work was focused in the foothills area between Umiat and the western boundary near Icy Cape. In 1980, 1,096 miles of seismic surveys were run, with one party in the coastal area and the other in the foothills and Brooks Range. Most of these surveys were for fill-in reconnaissance. During 1980 and 1981, seismic activities slowed, as it became apparent that Congress would open the National Petroleum Reserve – Alaska to private exploration, which occurred in spring of 1981.

The federal leasing program in the National Petroleum Reserve-Alaska commenced in 1982 with two lease sales in January and May. Most of the acreage was located in the south and southeastern portions of the National Petroleum Reserve – Alaska. A total of 271 tracts, totaling 5,035,772 acres, were offered in the two sales, and 38 tracts, totaling 927,965 acres, were leased. The leased activity was focused in the areas west of Nuiqsut, west of Umiat, and west of the Lisburne well. In both sales, the lessees appeared to be pursuing Umiat play-types. In July of 1983, a third sale was held, where 84 tracts and 2,195,845 acres were offered, spread across the northern portion of the National Petroleum Reserve – Alaska; 20 tracts, totaling 419,618 acres, were leased (USDOI BLM 1990b). These tracts appear to have been selected to evaluate Prudhoe Bay play-types and were largely concentrated in the area between Admiralty Bay and the Chukchi Sea. A fourth sale was scheduled for July 1984, but was cancelled after no bids were submitted on the 64 tracts and 1,550,677 acres offered (Weimer 1987, Banet 1991).

The leasing in the early 1980s resulted in the drilling of only one industry exploration well within the National Petroleum Reserve – Alaska, located in the western portion about 40 miles south-southwest of Point Barrow. The hole was dry and all other plans to drill were abandoned.

After the discontinuance of leasing in 1984, a 15-year hiatus in leasing activity and exploration in the National Petroleum Reserve – Alaska took place. It was not until after the 1994 discovery of the Alpine field in the Colville River Delta area that the government recognized the renewed industry interest in the National Petroleum Reserve – Alaska. After the discovery of the Alpine field, and in preparation for pending sales in the National Petroleum Reserve – Alaska, the major participants in ongoing North Slope exploration began to conduct 2-D and 3-D seismic programs in the probable sale area. The total line-miles of seismic data acquired are not known. There were at least seven 2-D programs acquired between 1992 and 1997 totaling 2,615 line-miles. A single 3-D program was shot in 1996 and covered an area of 152 square miles (Konbrath et al. 1997). There were additional 2-D and 3-D programs acquired since 1997; however, the number of programs and coverage are not known.

The BLM re-instituted leasing in the Northeast National Petroleum Reserve – Alaska in May 1999, restricting the sale to the Planning Area. Approximately 3.9 million acres were offered, drawing 132 high bids on 861,368 acres. The bulk of the leased areas are in the vicinity of Nuiqsut and between Teshekpuk Lake and the Ikpikpuk River. After the 1999 sale (Sale No. 991), the industry began an extensive drilling program in the northeastern portion of the National Petroleum Reserve – Alaska. Three wells were drilled in the winter of 2000, and an additional six wells were drilled in 2001. Most, if not all, of these wells were probably targeting Alpine-style prospects. An

additional sale was held in 2002, where a total of 60 tracts with 579,269 acres were leased. The leased acreage is generally to the south and west of previously acquired leases.

Following signing of the Northwest IAP/EIS ROD, the BLM held a lease sale in 2004 for 484 tracts of land within the Northwest National Petroleum Reserve - Alaska and another 22 tracts that are combinations of Northwest National Petroleum Reserve – Alaska and Planning Area lands, totaling approximately 5.8 million acres. Bids were received on 123 of the tracts, totaling 1,403,561 acres.

At least five of the wells drilled in the National Petroleum Reserve – Alaska have discovered oil and/or gas. The size of the discoveries has not been made public, but the operators have indicated that the oil reserves are at least equal to those of the Alpine field.

Arctic National Wildlife Refuge

The Alaska National Interest Lands Conservation Act (1980) established the Arctic National Wildlife Refuge (ANWR). In Section 1002 of that Act, Congress deferred a decision regarding future management of the 1.5-million acre coastal plain (1002 Area) in recognition of the area's potentially enormous oil and gas resources and its importance as wildlife habitat. A report on the resources (including petroleum) of the 1002 Area was submitted in 1987 to Congress by the USDOI. The 1002 Area of the Arctic National Wildlife Refuge has numerous active oil seeps, exposures of oil-stained sandstone, and large attractive structures. However, these lands are currently closed to industry and can only be opened for exploration and potential development by an act of Congress.

Because ANILCA prohibits it, there has been no leasing in the 1002 Area. However, in 1987, the Reagan administration proposed to trade land/exploration rights in the 1002 Area for Native corporation inholdings in National Parks and other sensitive areas. Six Native corporations were found qualified to participate and each chose an industry partner. The industry partners were to supply technical expertise and have exclusive right to explore any lands acquired by their Native corporation partners.

The federal government proposed and developed a tract selection/trade process and the Native corporations and their industry partners proceeded to bid on 71 complete or partial tracts; tracts were 4-square-mile parcels. Virtually all the prospective trade lands identified in the process were either along or to the east of the Marsh Creek Anticline. Unpublished industry evaluations tended to place a greater portion of the areas potential resources in the deformed area, including the Marsh Creek Anticline and areas to the east. This land trade, however, was never carried through to completion, nor were the lands transferred.

Data acquisition in the ANWR has been largely restricted to geological field parties in the Brooks Range, south of the 1002 Area, and to the limited seismic acquisition program conducted under government oversight in 1984 and 1985. These two seasons produced approximately 1,400 line-miles of mostly poor to moderately good data quality.

Since there has been no leasing within the 1002 Area, there has been no exploration drilling. However, Kaktovik Iñupiat Corporation holds surface title to some lands, and the city of Kaktovik lies within the boundaries of the refuge. British Petroleum/Chevron drilled a well on native lands through an exclusive exploration agreement with the Native corporation. The information from this well is held in confidentiality since it was drilled in 1986.

Furthermore, since there has been no drilling within the 1002 Area, there have been no discoveries. There were two discoveries, however, west of the Canning River that abut the 1002 Area. It is possible that either the Sourdough or Point Thomson fields may extend eastward into the 1002 Area. If and when they are developed, they may have the potential to drain oil and/or gas from beneath the Arctic National Wildlife Refuge.

Native Corporation Lands

The ASRC and its various village corporations have extensive land holdings across the slope. These extend from Barter Island in the east to the Chukchi Sea in the west and from the Beaufort Sea in the north to the crest of the Brooks Range in the south. The regional corporation and several of the village corporations have entered into

Table 4-32. Past, Present, and Reasonably Foreseeable Oil and Gas Development on the North Slope.

Unit/Area	Field/Satellite	Year Discovered	Year Began	Oil and Condensate			Natural Gas			Natural Gas Liquids	
				2003 (bbl)[1]	Cumulative (bbl)[2]	Reserves/ Resources (MMbbl)[3]	2003 (Mcf)	Cumulative (Mcf)	Reserve (Bcf)[3]	2003	Cumulative
Past Production and Development											
Duck Island	Endicott	1973	1987	9,104,149	419,868,726	162[4]	141,555,553	1,694,395,682	843	1,188,955	19,403,953
	Sag Delta North	1989	1989	--	--	--	--	--	--	--	--
	Eider	1998	1998	242,135	2,572,163	--	2,813,008	22,393,045	--	--	--
	Ivishak	--	--	91,649	7,917,658		64,026	6,487,744		604	111,333
Prudhoe Bay	Prudhoe Bay	1967	1977	141,301,777	10,570,908,475	3,024	2,840,910,387	45,301,397,532	23,879	24,972,399	419,564,568
	Lisburne	1968	1981	3,335,277	136,411,220	36	66,748,432	1,388,844,548		480,297	13,537,270
	Niakuk	1985	1994	4,599,262	76,464,287	44	3,385,803	64,418,997		38,543	910,971
	West Beach	1976	1994	9,769	3,356,041		201,454	19,952,910		1,061	219,730
	North Prudhoe Bay	1970	1993		1,984,791			6,616,438			84,599
	Pt. McIntyre	1988	1993	13,319,766	362,750,000	154	51,776,642	573,956,878		517,815	7,287,040
	Pt. McIntyre und.	1988	1997		33,480			30,008			600
	Midnight Sun	1998	1999	1,719,308	9,700,793	482[5]	3,499,585	33,901,582			
	Aurora	1999	2001	3,782,231	8,178,290		11,970,575	37,714,159			
	Borealis	1999	2001	11,790,725	21,574,963		9,465,803	20,082,471			
	Orion	2001	2003	368,058	465,163		311,963	369,868			
	Polaris	1999	2001	917,642	2,544,053		999,965	3,093,267			
	Niak IV-SR				65,388			504,427			
Kuparuk River	Kuparuk	1969	1981	58,536,233	1,918,003,873	1,031	107,454,326	2,284,395,578	611		3,345,638
	Tabasco	1992	1998	1,541,615	8,261,495	11	187,877	1,146,436			
	Tarn	1992	1998	12,342,736	54,248,115	83	12,834,804	77,122,641			
	West Sak	1969	1998	2,856,897	11,353,598	343	812,737	3,192,738			
	Meltwater	2000	2001	2,124,967	5,175,705	33	5,594,761	9,820,332			
	Palm	2001	2002			94					
Milne Point	Milne Point	1969	1985	11,602,243[6]	169,290,345[6]	503[7]	5,337,142	84,938,184	14		
	Cascade	1993	1996								
	Schrader Bluff	1969	1991	7,001,109	30,433,300		6,095,224	18,806,792			
	Sag River	1968	1994	101,470	1,541,239		121,173	1,568,098			
	Ugnu		2003	2,212	2,212		242	2,242			
Badami	Badami	1990	1998	281,552	4,347,065	0	3,697,960	22,891,313			
Colville River	Alpine	1994	2000	35,582,431	101,542,484	431	41,593,887	117,160,491	60		
Northstar	Northstar	1984	2001	22,968,022	42,136,227	191	70,861,557	121,163,273	450		

Table 4-32. Past, Present, and Reasonably Foreseeable Oil and Gas Development on the North Slope (Cont.).

Unit/Area	Field/Satellite	Year Discovered	Year Began	Oil and Condensate			Natural Gas			Natural Gas Liquids	
				2003 (bbl)[1]	Cumulative (bbl)[2]	Reserves/ Resources (MMbbl)[3]	2003 (Mcf)	Cumulative (Mcf)	Reserve (Bcf)[3]	2003	Cumulative
Past Production and Development											
National Petroleum Reserve Alaska	East Barrow	1974	1981				92,659	7,981,208	5		
	South Barrow	1949	1950				88,671	22,413,374	4		
	Walakpa	1980	1993				1,235,479	12,667,132	25		
	Umiat	1946			40536[8]	70[9]					
Total				**345,527,063**	**13,971,194,825**	**6,692**	**3,389,811,695**	**51,959,727,860**	**25,891**	**27,199,674**	**464,465,702**
Present Development and Production											
Colville River	Fiord (CD-3)	Present Development				332					
	Nanuq (CD-4)										
	Alpine West (CD-5)										
	Lookout (CD-6)										
	Spark (CD-7)										
Reasonably Foreseeable Oil and Gas Development											
Western Group	Kalubik	1992	Offshore			250					
	Thetis Island	1993	Offshore								
	Oooguruk	2003	Offshore								
	Nikaitchuq[10]	2004	Offshore								
Central Group	Gwydr Bay	1969	Offshore			320					
	Pete's Wicked	1997	Onshore								
	Sandpiper	1986	Offshore								
Eastern Group	Point Thompson	1977	Offshore			1,000					
	Liberty	1983	Offshore								
	Mikkelson	1978	Onshore								
	Sourdough	1994	Onshore								
	Yukon Gold	1994	Onshore								
	Flaxman Island	1975	Offshore								
	Stinson	1990	Offshore								
	Hammerhead	1985	Offshore								
	Kuvlum	1987	Offshore								
Undiscovered			Onshore			3, 660					

Table 4-32. Past, Present, and Reasonably Foreseeable Oil and Gas Development on the North Slope (Cont.).

[1] Annual production of oil in barrels (bbl) in 2003 (AOGCC 2004).
[2] Cumulative oil production in barrels (bbl) and natural gas in thousand cubic feet (Mcf) since discovery through 2003 (AOGCC 2004).
[3] Past Production and Development: Remaining reserves of oil in million barrels (MMbbl) and of natural gas in billion cubic feet (Bcf) as of December 2002 per ADNR Division of Oil and Gas (ADNR 2003), except where noted. Present Development and Production: Undeveloped reserves (MMbbls) from Alpine Satellite Development FEIS (USDOI BLM 2004c). Reasonably Foreseeable Oil and Gas Development: Resource estimates (1,570 MMbbls) for Western-Central-Eastern categories from Northwest IAP/EIS (USDOI BLM and MMS 2003). Resource estimates (MMbbls) for the Undiscovered Onshore category are from this document and the Northwest IAP/EIS (USDOI BLM and MMS 2003). Includes one-half of the resource of 2,054 MMbbls from Northeast National Petroleum Reserve - Alaska and one-half of 1,260 MMbbls from the Northwest National Petroleum Reserve - Alaska at $30 per bbl. Also includes 2.0 billion bbls from unnamed satellite fields.
[4] Endicott reserves include those in Endicott, Sag Delta North, Eider, and Ivishak.
[5] Includes reserves for the Prudhoe Bay satellites Midnight Sun, Aurora, Borealis, Orion, and Polaris.
[6] Milne Point includes Cascade annual and cumulative production.
[7] Combined Milne Point Unit.
[8] Total of oil produced on formation tests from Umiat test wells 1946-1952 (Collins 1958).
[9] Kumar, et al. (2002).
[10] Unit application approved April 29,2004 (ADNR 2004c).

Table 4-33. North Slope Oil Infrastructure (1968-2001).

	1968	1973	1977	1983	1988	1994	2001
Gravel Roads							
Oil field (miles)	0	100	139	294	358	370	400
Oil field (acres)	0	677	1,002	2,029	2,448	2,536	2,745
Dalton Highway (miles)[1]	0	170	170	170	170	170	170
Dalton Highway (acres)[1]	0	332	332	332	332	332	332
Gravel Pads							
Production, processing, support, exploration (facilities)	4	100	158	277	325	341	353
Production, processing, support, exploration (acres)	14	901	1,981	4,570	5,552	5,692	5,817
Airstrips	1	15	19	20	20	20	20
Airstrips (acres)	6	136	252	287	313	313	287
Offshore islands	0	0	2	12	15	16	17
Offshore islands (acres)	0	0	5	54	133	149	155
Gravel Mines							
In rivers (acres)	25	4,732	4,996	5,011	5,063	5,061	5,082
In tundra (acres)	0	34	151	745	1,179	1,186	1,283
Pipeline Corridors (miles)							
Oil field[2]	NA	NA	NA	NA	NA	NA	450
Trans-Alaska Pipeline[3]	0	166	166	166	166	166	166
Tundra Impacted Areas (acres)							
Gravel footprint areas[4]	352	2,045	3,620	7,354	9,013	9,225	9,557
Other impacted areas[5]	308	1,388	1,552	1,694	1,698	1,765	1,765
Gravel mines	25	4,766	5,146	5,756	6,241	6,364	6,364
Total Disturbed Area (acres)	685	8,200	10,319	14,804	16,952	17,354	17,686

[1] Does not include portions of the highway south of the North Slope.
[2] Multiple pipelines are included in some corridors, e.g., 366 miles have 1-5 pipelines and 73 miles have 6-11 pipelines.
[3] A buried gas pipeline roughly parallels the oil pipeline for 144 miles south to Pump Station No. 4; mileage only includes those on the North Slope.
[4] Includes gravel roads, gravel or paved airstrips, and offshore and onshore gravel pads/islands.
[5] Includes exploration site-disturbed area around gravel pad, exploration airstrip, peat roads, tractor trail, exploration roads, and gravel pad removed.
NA – Not available.
Source: NRC (2003).

exploration agreements with various petroleum companies. These agreements have generally required some form of initial monetary commitment, specific work commitments, and an agreement to lease potential acreage or forfeit the right to explore at an agreed upon date. One or more exploratory wells are also required if the company elects to go to lease.

There is no competitive leasing process utilized to make lands available to industry. The negotiations are generally confidential. Chevron, Texaco, ARCO, and Unocal have had such agreements in the past. Anadarko Petroleum and its partners currently have an exclusive exploration agreement with ASRC for nearly 3 million acres in the foothills of the Brooks Range.

The data acquired on Native corporation lands, especially seismic and geophysical data, are usually kept confidential, with the data only available to the corporation and its industry partners. However, with the recent interest in a gas pipeline, there is increased activity in the Brooks Range foothills, and the Native corporation lands are being reevaluated for both oil and gas. This has resulted in a recent increase and refocus of geologic field efforts in the foothills belt. Similarly, new seismic data were acquired during recent winter seasons. These seismic

programs included both 2-D and 3-D acquisition technologies.

Through ASRC's exploration agreements with various companies, one exploration well was drilled on Native corporation lands on the North Slope (ADNR 2001b). Some of these Native corporation holdings are in the form of inholdings within national parks, national monuments, and wildlife refuges. This has afforded those companies with Native corporation exploration agreements the opportunity to drill and evaluate areas that are not otherwise accessible and are off limits to the rest of the industry. These wells were drilled on inholdings within the Arctic National Wildlife Refuge and the National Petroleum Reserve – Alaska, as well as in the foothills of the Brooks Range south of the state acreage in the Colville-Canning area. There were also wells drilled on ASRC lands to the west of the National Petroleum Reserve – Alaska and there was one discovery associated with ASRC lands in the Colville River Delta. The Alpine field extends beneath leases jointly held with the state and BLM.

Cleanup and Rehabilitation Activities on the North Slope

Concurrent with exploration in the 1970s was a greater awareness of the need to protect the Arctic environment from exploration activities and to clean up debris left from earlier exploration activities. Equipment and supplies that were previously hauled by D-8 Cat trains, sometimes during the summer with the blade down, were now moved in winter by rolligons—large vehicles with low-pressure balloon-like tires. In 1975, the Navy began preparing an EIS for activities in the northeastern portion of PET-4; this EIS would later expand to cover the entire Reserve and was completed in spring 1977. As part of the Final EIS, the Navy, in cooperation with the USGS, drew up stipulations concerning winter road and trail construction.

In 1976, drilling fluids from a site near Teshekpuk Lake broke through a retaining berm and flowed into Teshekpuk Lake. Although the amount of damage to the environment was minimal, all future reserve pits were designed to contain the total estimated volume of drill cuttings and muds below the level of the original tundra surface.

In 1976, a cleanup program was initiated, based out of Point Lonely and Barrow. During the summer of 1976, over 23,500 drums were retrieved and 750,000 pounds of debris collected. In 1977, another 26,500 drums and 485 tons of debris were collected. In 1978, over 2 million pounds of debris were collected, primarily from the Skill Cliff Air Force Tower site and the Navy's Topagoruk and East Topagoruk test well sites. In 1979, another 1.8 million tons of debris were collected at old Navy sites and other sites in the National Petroleum Reserve – Alaska.

Rehabilitation of pads and other disturbed sites began in the late 1970s, with the focus on lowering the drill pads and obliterating their straight edges, filling reserve pits, and revegetating sites. Germination success varied depending upon growing conditions during the summer; wet and foggy summers usually resulted in poor germination. It is estimated that about 550 acres were disturbed during the 1975-1982 USGS exploration program, that revegetation was attempted on 440 acres, and that vegetation became well established on nearly 400 acres by 1982.

4.7.3.2 Present Development and Production on the North Slope and in the Planning Area (2005-2008)

Present Development and Production (within the next few years) includes fields that are in the final planning stages for development or are under construction but have not yet begun production (Table 4-32). Infrastructure components, scheduling, and reserve estimates are fairly well defined, although reserve volumes are likely to be revised as information is obtained during production operations. Because many new developments on the periphery of existing infrastructure would be tied to these facilities, continued operation of current production facilities and transportation systems is vital to new development projects.

The Alpine Satellite Development Plan would develop five new fields (CD-3 through CD-7) tied into the existing Alpine oil field infrastructure (USDOI BLM 2004c). This project is in the permitting stage, with the first of these satellite fields expected to be operational by 2007. The ADNR estimates the five pads, corresponding with former

exploratory well locations, could produce a total of 330 MMbbl of oil in the next 2 decades (ADNR 2003). In August 2004, ConocoPhillips announced a proposed expansion of the CD-2 field, with original oil in place in the expansion area estimated at 31 to 55 MMbbl (Petroleum News Alaska 2004a).

Produced fluids would be transported by pipeline to the Alpine CPF for processing. Gravel roads would connect CD-4 through CD-7 to existing Alpine oil field infrastructure. Proposed field CD-3 would be constructed with a gravel airstrip, but without a gravel access road. Gravel used for construction of roads, pads, and airstrips would be obtained from the existing ASRC Mine Site and the Clover Potential Gravel Source. A bridge across the Nigliq Channel near CD-2 would accommodate road traffic and the pipelines. Proposed field CD-6 and its access road and pipelines would be within a 3-mile setback from Fish Creek, established by the 1998 Northeast IAP/EIS ROD (Lease Stipulation 39[d]). Consistent with the requirements of the 1998 Northeast IAP/EIS ROD, the Alpine Satellite Development ROD grants an exception to allow this infrastructure within the setback. Additional exceptions are granted to locate oil infrastructure within 500 feet of some water bodies (Lease Stipulation 41) and to allow roads between separate oil fields (Lease Stipulation 48). Aboveground pipelines would be supported on VSMs and would be at elevations of at least 7 feet above the tundra at VSMs. Powerlines would be supported by cable trays placed on the pipeline VSMs; cable trays would not hang below the pipelines. Both industry and local residents would use the gravel roads.

Other projects likely to come into production in the next few years include additional development at two drill sites in the Kuparuk River Unit West Sak oil field, where production would increase by approximately 45,000 bbl per day in 2007 (Petroleum News Alaska 2004b).

4.7.3.3 Reasonably Foreseeable Future Development and Production (Within the Next 20 Years)

Reasonably Foreseeable Future Development and Production includes projects that are reasonably foreseeable to begin development within the next 20 years. These projects could develop discoveries that are listed in Table 4-32; however, many of the listed discoveries were made decades ago and have remained non-commercial to this day. Development of these discoveries would depend largely on technology advancements and higher petroleum prices. The developments most likely to occur would be near existing fields, so infrastructure systems could be shared.

Additional amounts of oil could be produced by enhanced recovery technology from existing fields and from undeveloped (or undiscovered) satellite pools adjacent to existing production areas. Some of this production would replace declining production at existing fields. Although the extent of both of these new resources (reserve growth and satellites) is as yet undetermined, it is reasonable to assume that a portion would be brought into production in the next 20 years. It is assumed for analysis that half of the 4 Bbbl estimated for enhanced recovery and satellite fields would be brought into production in the foreseeable future. Because enhanced recovery and satellite fields would be developed largely from existing infrastructure, the incremental addition of new infrastructure and related land disturbance is expected to be minimal.

The full-field development scenario for the Alpine Satellite Development was included under reasonably foreseeable future development/production for the *Alpine Satellite Development Plan EIS* and in the assumptions made for the cumulative effects analysis for this amendment. Under the full-field development scenario, 2 additional CPFs (with production facilities), and 22 additional production pads, could be constructed in the Alpine Satellite Development Area. Gravel roads would connect all pads except four pads in the lower Colville River Delta (downstream from the existing CPF), and one pad near the Kogru River. Production pads not accessed by roads would be accessed by air, and would have gravel airstrips. Although considered reasonable foreseeable for purposes of this amendment, it is uncertain whether the oil and gas resources would be discovered in the future.

Northwest National Petroleum Reserve - Alaska

The *Northwest National Petroleum Reserve – Alaska IAP/EIS* evaluated the potential for oil and gas development in the Northwest National Petroleum Reserve – Alaska (USDOI BLM MMSA 2003). The January 2004 ROD

resulted in the opening of all BLM lands within the Northwest National Petroleum Reserve-Alaska to oil and gas leasing with the exception of 1,570,000 acres in the Wainwright area that were deferred for 10 years, and 440,000 acres in the Colville River Special Area were that deferred until a Colville River Management is completed. This left approximately 77 percent of the Northwest National Petroleum Reserve - Alaska open to leasing.

The Northwest National Petroleum Reserve – Alaska has a much lower economic potential on a per-acre basis than the Planning Area. The Northwest National Petroleum Reserve – Alaska is over twice as large as the Planning Area, but has only an estimated 31 percent of the combined total oil resources, and 46 percent of the combined total gas resources found in the National Petroleum Reserve - Alaska. The Northwest IAP/EIS predicted that under a high oil price ($30 per bbl) and a multiple lease scenario, as many as 36 exploration wells, 36 delineation wells, 12 production pads, and 295 miles of pipelines would be constructed (USDOI BLM MMS 2003). Under this scenario, up to eight fields are expected to be developed and would produce up to 1,260 MMbbl of oil, with a peak oil production of 50 MMbbl per year.

South National Petroleum Reserve - Alaska

The BLM intends to prepare an IAP/EIS for the South National Petroleum Reserve - Alaska to determine the appropriate management for these 9.2 million acres of federal lands located southwest of the Planning Area. The IAP/EIS would determine what lands would be made available for oil and gas leasing and for exploration and potential development of coal and hard rock mineral resources.

Although it is unlikely that the South National Petroleum Reserve - Alaska has oil resources equivalent to the volumes thought to occur in the Planning Area, the natural gas potential is relatively high. Presently, all natural gas on the North Slope is stranded as there is no natural gas transportation system for delivering the product to markets. However, exploration and production of natural gas could occur in the South National Petroleum Reserve - Alaska if a gas pipeline was constructed to transport the gas from the North Slope. The construction of such a pipeline, and the consequential development of North Slope natural gas resources, is considered speculative at this time (see Section 4.7.3.4, Future Gas Development).

The South National Petroleum Reserve - Alaska may contain important hardrock mineral deposits. A series of high-grade lead-zinc-silver veins are believed to occur in the South National Petroleum Reserve - Alaska. Phosphate rock resources, with an indicated volume of 15.7 tons, are thought to occur in the Upper Cretaceous Lisburne Group to the east of the South National Petroleum Reserve - Alaska and these same geologic formations extend westward across much of the southern portion of the South National Petroleum Reserve - Alaska. Seven barite occurrences hosted by the Permian Siksikpuk Formation have been identified and industry has expressed interest in development of these resources. Occurrences of uranium would also be expected in this geologic environment.

The South National Petroleum Reserve - Alaska could also contain coal resources located within the Nanushak Group formation, where coal seam thickness totals more than 300 feet. Martin and Hawley (1986) identified North Slope coal resources totaling 150 billion tons, the bulk of which lies within the National Petroleum Reserve-Alaska. Coal bed methane could also be associated with such coal deposits.

The National Petroleum Reserve - Alaska was closed to mining as part of the creation of PET-4 in 1923. This intent was reinforced by Section 102 of the NPRPA, which withdrew the area from all forms of disposition and entry under the mining laws. These laws would have to be changed for the BLM to lease lands within the South National Petroleum Reserve - Alaska for mineral exploration and development. Additionally, there are no transportation routes for the export of minerals, making development of these resources unlikely in the in the near term.

4.7.3.4 Speculative Development (Beyond 20 Years)

Speculative Development includes undiscovered (purely speculative) resources that may be developed beyond the

foreseeable future (perhaps more than 20 years from now), including undiscovered oil resources that may be found as a result of future state and federal lease sales. Although the North Slope could continue to play a major role in meeting the energy requirements of the United States throughout the 21st century, several key elements will greatly influence the magnitude, stability, and duration of that role. Among the most significant of these factors are oil and gas prices, land availability, regulatory environment, and level of competition.

Prices

The price structure and stability for oil, and to a lesser extent gas, would play a pivotal role in the future of the petroleum industry in Alaska. With low oil prices, the high cost of producing a barrel of oil in Alaska places North Slope crude oil at a disadvantage relative to the OPEC cartel and other low-cost producers. It also tends to use up funding for Alaskan projects by the producing companies who can realize a greater return on investments in low-cost environments. When oil prices are higher, such as occurred in late 2004, the return on investment is much greater and exploration and development opportunities become more attractive to industry on the North Slope.

Land Availability

Even with sustained high oil prices, there will be no significant reserve additions without attractive exploration opportunities. These opportunities only exist when there is a continued and diverse offering of exploration acreage. A successful exploration effort requires that a broad mixture of potential play types of a size sufficient to provide economically viable targets be made available in a predictable and systematic manner. In such a scenario, exploration would provide a spectrum of field sizes such that the larger accumulations generate the demand for the infrastructure, which would in turn create an environment in which smaller fields (satellites) may be profitable to develop.

In the near future, the available relatively low-cost operating areas near existing infrastructure will have been reasonably well explored. They will be deemed to no longer have the potential to yield discoveries of sufficient size to replace the production lost due to decline of the older major fields. At that point, there would either be pressure to open additional lands to exploration or it would be acknowledged that the region's oil production is in decline and that reduced production would eventually lead to the shutdown of operations and the TAPS pipeline.

Prediction Versus Reality

Apparent failure of early stage predictions, regarding reserve size, number of wells to be drilled, size of areas to be affected by development, and miles of roads and pipelines, can raise concerns (NRC 2003). Obviously, if anticipated potential effects are based on the early stage predictions, any significant deviation from those forecasts would result in a difference in the magnitude of any activity-associated effects.

The problem lies in the failure to recognize that each of these predictions, whether they are the number of oil fields in an area, the size of the accumulations, or the amount of infrastructure necessary, is based on very little solid scientific data. When exploration begins in a new area, like in the North Slope in the 1960s, no one has direct evidence of the true nature and distribution of potential reservoirs in the subsurface, let alone the presence or volume of hydrocarbons that may be present. Seismic data used to determine the presence of potential structures and traps, and outcrop exposures, often tens or hundreds of miles away, are the sole source of possible reservoir data. Based on these bits of information, a first prediction is made as to the probability of oil or gas being present, and then if the assumptions regarding structure, trap, reservoir, and source are reasonable, what range of hydrocarbon volumes the feature could contain. The reality of potential volumes, as revealed by exploration drilling, may be very different from the pre-drill predictions.

Prudhoe Bay was a definite surprise; it was much larger than expected and the vast bulk of the oil was found to be in a rock that was unknown as a reservoir target prior to drilling the well. Original predictions for the field were wrong; the second prediction at Prudhoe Bay was that the field contained 9.6 Bbbl (403.2 billion gallons) of recoverable oil, and subsequent planning for the field used that reserve figure. Now, advances in technology and geologic variability in the reservoir have placed current estimates of recoverable oil at 13 Bbbl.

Similar results have been noted at Kuparuk and Endicott fields, but the Lisburne field has not met expectations in terms of daily production rates or cumulative production. This is largely the result of applying the incorrect reservoir model to the field in its early stages. Predictions made at the time of the discovery of these fields did not recognize the upside that existed (or the downside in the case of the Lisburne field). As a result, estimates of the life span of the fields, size of areas to be affected, number of wells to be drilled, and other variables were not precise.

Additionally, the development of the infrastructure at Prudhoe Bay, Kuparuk, and TAPS made exploration for previously unrecognized or ignored nearby small accumulations feasible. This again contributed to a larger area of development than was forecast at the time of the original estimates. It must be recognized that these satellite fields were either unknown, not economic under then present economics, or were known to individual companies as a result of proprietary data which were not shared with competitors for obvious reasons.

These early estimates work both ways, as there tend to be more over-estimates of potential than under-estimates. The public generally never hears of these because the either the company drills a dry hole and abandons the project, or it acquires additional data that indicates the prospect is invalid or uneconomic and no drilling occurs. The most notable failure in north Alaska was the Mukluk well, the potential thought to rival Prudhoe Bay. Exploration, leasing, and drilling costs totaled as much as $2 billion; the well was drilled and abandoned as a dry hole.

Uncertainty and risk are the nature of the exploration business. Any company that is willing to spend the money and time to acquire data, lease land, and drill exploration wells is hoping for a discovery of a size sufficient to justify the costs and provide an adequate, competitive return on the investment. The company is also hoping that the field will provide the infrastructure to support possible nearby accumulations when and if they are found.

When an exploration company acquires a new lease or block of leases, it will often permit multiple well locations. In reality, only a fraction of these locations are normally drilled. This is due either to a failure to discover an economic accumulation in the most favored locales, or because the initial interpretation of the geology was incorrect.

Historically, the successful prediction of exploration and development activity (how much, when, and where) was an art as well as a science. Recent technological advances have resulted in much improved exploration success rates, but frontier areas still have high risks and failure rates. With the full awareness of this uncertainty, a range of potential and cumulative effects of future oil and gas activities can be addressed. The best approach is to use the knowledge derived from known activity, and its effects, and project a likely case into the future, with a series of scenarios that vary the future activity within reasonably constrained limits. Although this approach is still unable to guarantee when, where, and how much, it should provide the most reasonable range of estimates of the overall effects of future activities.

Among the speculative fields listed in Table 4-32 are some that were discovered 50 years ago and remain noncommercial today because of their very remote locations, low production rates, or the lack of a gas-transportation system. Because they are not likely to become commercially viable in the foreseeable future, the effects of development and production associated with these fields are not discussed in detail in the cumulative impacts analysis. A detailed discussion of cumulative impacts is not possible when a reasonable estimate of the location, size, or development schedule cannot be made.

Future Gas Development

Development of natural gas resources on the North Slope is considered speculative at the present time because there is no transportation system to move gas to outside markets. Numerous gas discoveries have been uneconomical to produce for several decades, and would remain undeveloped until a transportation system is constructed. The viability of a transportation system is questionable, and there is no guarantee than one would ever be built, despite the non-binding proposals by several pipeline development groups. The largest known gas accumulation on

the North Slope is in the Prudhoe Bay field, with 46 Tcf originally in place and approximately 25 Tcf available for sale. Gas reserves from the Prudhoe Bay field would provide the backstop for a future gas transportation system, but would be insufficient to fully utilize the capacity of the new system for the decades of gas production needed to recover the project's cost. A gas export project (likely a pipeline) would rely on existing, shut-in gas resources, as well as new, large gas discoveries to supply a large-scale project lasting for more than 30 years. Most of the known gas resources are identified in oil fields on the North Slope, and no active exploration for new gas fields has occurred. When (or if) a large sale gas export project is constructed, exploration and development activities targeting new gas fields is likely to move into previously untested areas, both onshore and offshore.

The BLM and MMS 2002 oil and gas resource assessment estimated that 8.5 Tcf of natural gas resources are economically recoverable in the Planning Area at a benchmark price of $4.27 per Mcf (equivalent to a $30 oil price; Table 4-34). This analysis was based on assumptions that a transportation system (pipeline) would be constructed and have a delivery tariff to the Midwest states of $2.50 per Mcf. Economic gas resources are not listed at a price of $2.85 per Mcf (equivalent to a $20 oil price) because the minimum required market price for new gas fields in the National Petroleum Reserve – Alaska is approximately $3.00 per Mcf. However, as mentioned earlier, commercial gas production would not occur until there is a transportation system to move North Slope gas to outside markets.

If gas field development occurs in the future, as with crude oil, the magnitude of production would be dependent on price. In Table 4-34, the gas resources for different gas prices and project alternatives are shown. For the $2.85/Mcf case, no commercial gas production would occur whether or not a gas pipeline to the North Slope was present. Any associated gas produced with the oil would be re-injected. At $3.56/Mcf, commercial gas production would occur, and it is expected that the gas produced at that price would be associated gas (gas produced in association with the oil) produced from oil fields in the northern part of the Planning Area. The higher gas price of $4.27/Mcf would support development of stand-alone gas fields. It is expected that commercially viable gas accumulations would most likely occur in the southern portion of the Planning Area where the hydrocarbon systems are more gas-prone. Whether a hydrocarbon accumulation is classified as an oil or gas field depends upon the gas to oil ratio (GOR) in the hydrocarbon fluids. An accumulation is considered a gas accumulation if the GOR is greater than 20,000 cubic feet per barrel (USGS 1995). A gas accumulation could have varying amounts of hydrocarbon liquids (crude oil, gas condensates, and natural gas liquids).

If associated gas is commercially produced, it would be separated from the oil and produced water at field processing facilities and would be placed into gas transportation pipelines. In contrast to oil pipelines constructed on the North Slope, gas pipelines would be buried for most of their length. River crossings would be accomplished through the same methods as for oil pipelines. The optimum temperature for gas pipelines is below 32°F (0°C). Gas would have to be dehydrated, compressed, and cooled before entering the pipeline. Construction of a gas pipeline would utilize ice roads for heavy equipment, and the major disturbance that would result is the excavated trench. The permafrost would not thaw because of the temperature of the pipeline. It is expected that pipelines that transport associated gas would utilize the same corridors used for crude oil transportation pipelines. Depending on the throughput and other factors of pipeline design, stations for compressing and cooling the gas would be built at regular intervals (60 to 100 miles) along the pipeline to maintain optimum operating conditions. The footprint of the compressor station would consist of a 10 to 20-acre pad, depending on the design of the facilities. It is possible that compressor stations would also be connected to pipelines from other fields or satellites.

For stand-alone gas field development, the impacts of field development would be similar to development of an oil field (Table 4-3); the major difference would be in certain kinds of processing equipment. Field gathering lines would not have to be buried, and would be placed aboveground the same as oil field gathering lines. A gas pipeline would have to be constructed to move gas to existing infrastructure east of the Planning Area or by separate pipeline to the major North Slope transportation pipeline, the terminus of which would be located at Prudhoe Bay. In areas of existing infrastructure, the pipelines would utilize existing pipeline corridors where possible. In addition, an oil transportation pipeline could be associated with the gas pipeline if economics were to justify the production of crude oil. Commercial production of natural gas liquids might not be feasible because of lack of infrastructure to handle those commodities.

Gas Transmission Line Proposals

Efforts to permit and build a pipeline for the transportation of natural gas from the North Slope to various markets have been ongoing since at least 1973. Preliminary plans to construct transportation systems (generally pipelines) have been repeatedly offered, but have yet to secure all of the required permits, agreements with gas producers, financial backing, or marketing commitments. All project proposals to date have failed to overcome high construction costs (estimated between $10 and $20 billion) and marketing hurdles, so the proven gas resources (estimated at 35 Tcf) and undiscovered/potential gas resources (estimated at 100 Tcf) remain stranded on the North Slope.

In 1976, at least three separate projects were proposed, and EISs were prepared for each one. One project, the Alaska Natural Gas Transportation System (ANGTS), was designed to transport natural gas from Prudhoe Bay south along TAPS to the Fairbanks area, and then westward along the Alcan Highway to Caroline, Alberta, where the pipeline would then fork, with one fork taking gas to the U.S. West Coast and the other proceeding to the U.S. Midwest. Another proposed pipeline project would have transported natural gas from Prudhoe Bay eastward to the McKenzie Delta and south along the river, eventually reaching the U.S. West and Midwest. The third proposed pipeline project would have transported the natural gas in a new pipeline along TAPS to the Prince William Sound area, where the gas would be liquefied and transported as liquid natural gas (LNG) to markets via tankers. The federal government, foreseeing a petroleum energy shortage, passed federal legislation that would have expedited the permitting of the pipeline and entered into treaties with Canada. The U.S. and Canadian governments selected the ANGTS project from the three proposals, and though ANGTS was largely designed and permitted, it was never constructed for various business reasons. The proponents have maintained most of the required permits and ROWs for this project.

Alaska natural gas was revisited in the 1980s, when yet another pipeline project was proposed. The Trans-Alaska Gas System (TAGS) would have brought gas along a new pipeline in the TAPS corridor south to Valdez, where it would be liquefied and shipped overseas as LNG. AN EIS was completed and several authorizations and ROWs were obtained, but the project was never constructed.

In 2000, the major North Slope producers (ExxonMobil, ConocoPhillips, and BP) reportedly spent over $100 million conducting studies along potential routes in Alaska and Canada to determine the feasibility of constructing a gas pipeline between the North Slope and the U.S. Midwest. They concluded that the project was not economically viable at that time and that a number of issues needed to be resolved to allow the project to move forward. These issues included higher and more stable gas prices, technology advancements, and numerous federal and state government regulatory approvals that would provide regulatory streamlining and fiscal certainty. The State of Alaska has also passed a Stranded Gas Act that allows the state to negotiate with project proponents in a fashion that would also provide some of these measures.

In January 2004, a consortium of companies filed a formal proposal to the Alaska Department of Revenue under the Stranded Gas Act to build a natural gas pipeline from the North Slope into Canada that would ultimately be used to ship natural gas into the lower 48 states (Yahoo! 2004). The proposed 745-mile pipeline route would go from the North Slope southward to the Alaska-Yukon border at Beaver Creek. The application was subsequently withdrawn; however, a number of other groups have submitted applications or indicated that they will soon file applications. The North Slope producers (ExxonMobil, ConocoPhillips, and BP) have also filed an application under the Stranded Gas Act for a gas pipeline to the Lower 48 states. The Alaska Natural Gas Authority was created by a statewide ballot measure, with the stated purpose of developing a gas pipeline from the North Slope to Valdez where the gas would be liquefied and transported as LNG. The Alaska Natural Gas Authority has submitted an application for their project under the Stranded Gas Act. An Alaska Gasoline Port Authority, consisting of the City of Valdez and the Fairbanks North Star Borough, has filed an application for a similar pipeline to transport North Slope natural gas to Valdez for liquefaction and sale. Several large pipeline companies have also entered into agreements with the state indicating they will be submitting applications for various pipeline projects to get North Slope natural gas to market.

It should be noted that none of the aforementioned project proponents have submitted applications for environmental permits or ROWs; all applications to date have been filed under the Stranded Gas Act and relate only to fiscal negotiations with the State of Alaska. Because there are abundant gas reserves on the North Slope, it is likely that some exploration targeting new undiscovered gas resources in areas remote from existing infrastructure may occur during the life of this plan. However, the development scenarios do not include the production of natural gas for sale outside of the Planning Area. Until a major transportation system is constructed, future gas discoveries will be shut-in (startup delayed for an undetermined period). Associated gas recovered as a byproduct of oil production would be used as fuel for facilities or reinjected into reservoirs to increase oil recovery. The reinjected gas would not be lost as a potential future resource, but gas sales to outside markets would be postponed for the foreseeable future.

A new gas-processing technology, termed "gas-to-liquid" (GTL), can be used to convert natural gas to a refined liquid product that could be transported through TAPS. This strategy could accelerate natural gas production on the North Slope, including stranded gas fields in the National Petroleum Reserve – Alaska. However, this new technology is untested for large-scale operations and is, at the present time, a more expensive proposition than constructing a large-diameter gas pipeline. In the future, GTL technology could be used to produce gas from small, remote fields in the Planning Area.

Table 4-34. Gas Resource Estimates for Each Alternative.

Alternative	Low Price Scenario		Medium Price Scenario		High Price Scenario	
	Tcf ($2.85/Mcf)	Number of Fields	Tcf ($3.56/Mcf)[1]	Number of Fields[2]	Tcf ($4.27/Mcf)[1]	Number of Fields[2]
A	0[3]	1	NA	NA	NA	3
B	0[3]	2	3.318	10	5.274	14
C	0[3]	2	3.926	12	6.113	17
D	0[3]	1	2.702	8	4.575	12
FEP[4]	0[3]	3	6.076	19	8.509	24

[1] Two-thirds of the economic gas resource is associated with oil and one-third of the gas resource is in non-associated pools.
[2] Number of fields includes large CPF fields with production facilities and small satellites that share those facilities. Both oil and gas fields are included in this total.
[3] Gas production for outside sale is not economic at this price (see Figure APP-05; USDOI BLM MMS 2003).
[4] FEP (Full Economic Potential) represents the total undiscovered, potentially commercial, petroleum endowment assessed in the Planning Area. The FEP development scenario is not analyzed here and is shown for comparison purposes only.
NA = Not analyzed. The 1998 Northeast IAP/EIS did not analyze a $25 per bbl scenario or the sale of natural gas.

Because the export of known gas resources is uneconomical today, it is difficult to predict the viability, timing, or scale of future gas production projects. If a gas transportation system were constructed in the future, current gas reserves associated with existing oil production would be used before the industry was likely to invest in new gas exploration. The development of remote, undiscovered, and more expensive gas resources is considered to be unlikely as long as there are adequate supplies of known, readily available reserves. Thus, the cumulative impacts of future natural gas development are not analyzed in this amendment.

4.7.3.5 Oil Production on the North Slope of Alaska

Production Through 2003

From 1977 to the end of 2003, North Slope developments produced 14.4 Bbbl of oil and natural gas liquids (AOGCC 2004). Production on the North Slope peaked in 1988 at 2.0 MMbbl of oil per day, declining to its current rate of approximately 0.99 MMbbl per day (ADR 2004b). Of the producing fields on the North Slope, the

most productive (in order of decreasing productivity) are Prudhoe Bay, Kuparuk River, Point McIntyre, and Endicott.

Resource Estimates Used for this Cumulative Effects Analysis

A range of reserve and resource estimates shown in Tables 4-35 and 4-36 were used for analyzing cumulative effects from production onshore of the North Slope and in the Beaufort Sea. These estimates consisted of a low range of 7.37 Bbbl, a mid-range of 12.6 Bbbl, and a high range of 18.77 Bbbl.

The Low Range - Past and Present Production

The low end of the range of oil production for the cumulative analysis takes into consideration past and present production. This production includes reserves (7.04 Bbbl) in currently producing fields and resources (0.33 Bbbl) in discoveries in the planning or development stage (Table 4-35).

The Mid-Range - Past, Present, and Reasonably Foreseeable Future Production

The mid-range of oil production for the cumulative analysis is based on past, present, and reasonably foreseeable future production. This amount of 12.6 Bbbl is composed of the 7.37 Bbbl from the low range added to discoveries that may be developed in the next 20 years. Reasonably foreseeable future production (5.23 Bbbl) consists of: 1) discoveries totaling 1.57 Bbbl onshore and offshore (Western-Central-Eastern Groups; and 2) undiscovered onshore resources of 3.66 Bbbl from the category of Undiscovered Onshore Resources shown (Table 4-36.) The Planning Area represents about 8 percent of the volume of this mid-range figure.

The High Range - Past, Present, Reasonably Foreseeable Future, and Speculative Production

The high range of production for the cumulative analysis is 18.77 Bbbl, which includes existing, planned, possible, and speculative production. The number is derived from the 12.6 Bbbl from the mid-range figure, added to speculative future production of 6.17 Bbbl and includes onshore and offshore resources as described in Table 4-36. The Planning Area represents about 11 percent of the volume of the total of past, present, reasonably foreseeable future, and speculative production. As discussed earlier, the Amended IAP/EIS is not analyzing the effects of speculative production.

4.7.3.6 State Lease Sales Considered in This Cumulative Effects Analysis

Since December 1959, the State of Alaska has held 50 oil and gas lease sales involving North Slope and Beaufort Sea leases. More than 9.8 million acres have been leased; some areas have been leased more than once because some leases expired or were relinquished. Historically, less than half of the tracts offered in state oil and gas lease sales have been leased. Of the leased tracts, about 10 percent have actually been drilled, and about 5 percent have been developed commercially (Map 3-3). About 88 percent of the leased areas are onshore or nearshore, and about 12 percent are offshore. From the early 1960s through 2003, 402 exploration wells were drilled in State of Alaska onshore and offshore areas (S. McMains, AOGCC, pers. comm). During this period, the number of exploration wells drilled annually has ranged from two to 35. During the 1960s, 58 wells were drilled, 97 wells were drilled in the 1970s, and 105 wells were drilled in the 1980s. From 1990 through 2003, 142 wells were drilled and the number of exploration wells drilled annually averaged 10. Fifty-three of the exploration wells have resulted in discoveries, a success ratio of about 13 percent.

The State of Alaska develops and approves an oil and gas-leasing plan for a 5-year period, reassesses the plan, and publishes a schedule every year. Except for Northstar, all of the North Slope and Beaufort Sea's commercially producible crude oil is on 1,212 active state leases (as of December 2003) broken down as follows: 1.35 million acres onshore along the Slope; 498,000 acres offshore in the Beaufort Sea; and 456,000 acres of active leases that straddle onshore and offshore acreage. Production through 2003 from state leases (with a small recent contribution

from federal leases at Northstar) totals 13.97 Bbbl. The latest state lease sales—North Slope Areawide and Beaufort Sea Areawide—were held in October 2004 (Petroleum News Alaska 2004c). Between the end of 2004 and 2008, the State of Alaska is expected to hold the following annual areawide lease sales annually:

- Beaufort Sea Areawide sale including unleased state (within 3 miles of coastline) waterbottoms from Barrow to the Canadian border each October;
- North Slope Areawide sale, including unleased state lands between the Arctic National Wildlife Refuge and the National Petroleum Reserve – Alaska each October; and
- North Slope Foothills Areawide sale, extending into the foothills of the Brooks Range each May.

The state has not yet estimated oil and gas resources involved in these future lease sales, but informal industry estimates project 4 Bbbl in undiscovered resources on state lands on the North Slope, which include both leased and unleased state properties. Most are expected to be producible only as satellites.

The State of Alaska is continuing efforts to drill a stratigraphic test well offshore of Arctic National Wildlife Refuge. The state also recently developed a new mitigation measure (Mitigation Measure 18) to ensure that exploration, development, and production activities are conducted in a manner that prevents unreasonable conflicts between oil and gas activities and subsistence whale hunting. The lessee has to consult with the NSB and Alaska Eskimo Whaling Commission to discuss how siting, timing, and methods of proposed operations can be planned and carried out to avoid potential conflicts with subsistence whale hunting (Petroleum News Alaska 2004c, d).

4.7.3.7 Federal Lease Sales Considered in This Cumulative Effects Analysis

In this analysis, lease sales for the federal OCS and the National Petroleum Reserve – Alaska are considered. Although Northstar production from the federal OCS is small (1,131,639 bbl to May 2002), possible future production from Sale 186 is estimated at 460 MMbbl. As indicated above, speculative future onshore and offshore production of 6.17 Bbbl of currently undiscovered resources is also estimated (Table 4-36).

Since December 1979, the USDOI has held eight lease sales in federal waters of the Beaufort Sea. The latest, Sale 186, was held in September 2003. The Beaufort Sea Sale 195 is scheduled for March 2005; another sale is scheduled for March 2007. Over 720 leases have been issued in the Beaufort Sea, totaling 3.7 million acres. About 30 wells have been drilled on federal leases, with 9 wells determined to be producible. All wells have been plugged and abandoned, because field economics have not favored production. There are 64 active leases on federal submerged lands in the Beaufort Sea. The Kuvlum and Hammerhead units are potentially producible, although not currently leased, but there are no estimates of available resources. The Northstar Unit comprises two federal tracts. These tracts contain less than 20 percent of Northstar's estimated 158 MMbbl of oil reserves.

Table 4-35. Summary of Reserve and Resource Estimates Used in the Cumulative Analysis.

Production Activity	Oil (Bbbl)	Contribution to Total North Slope Resources by Volume of Oil (%)
Low End of the Range (Past and Present)	7.37	0
Middle Portion (Past, Present, and Reasonably Foreseeable)	12.60	8
High End (Past, Present, Reasonably Foreseeable, and Speculative)	18.77	11
Sources: USDOI BLM and MMS (2003), USDOI MMS (2003c), and AOGCC (2004).		

Table 4-36. Production, Reserves, and Resource Estimates Used in the Cumulative Analysis[1].

Timeframes and Field or Area	Oil (Bbbl)[1]	Gas (Bcf)[1]
Past and Present (total)	**7.37**	33[2]
Onshore–past	6.69	33[2]
Offshore–past	0.35	
Onshore–present	0.33	
Reasonably Foreseeable Future (total)	**5.23**	0.75[3]
Discovered Onshore and Offshore	1.57	
Undiscovered Onshore	3.66[4]	
Speculative (total)	**6.17**	32,800[5]
Onshore	3.66[6]	
Offshore	2.51[7]	
Total	**18.77**	**32,834**

[1] Production and reserve data are as of December 2003.
[2] Gas production to date is from Barrow gas fields supplied for local use to the Barrow community.
[3] All gas production from existing oil fields is used by facilities for fuel or reinjected for reservoir pressure maintenance. No gas production is transported and marketed outside the North Slope.
[4] Includes one-half of the resource of 2.054 Bbbls from Northeast National Petroleum Reserve - Alaska (this amendment) and one-half of the resource of 1.260 Bbbls from Northwest National Petroleum Reserve - Alaska at $30 per bbl. Also includes 2.0 Bbbls from unnamed satellite fields.
[5] Future production of natural gas assumes that a transportation system will eventually be constructed to move North Slope gas resources to outside markets. All proposed systems are uneconomic under current conditions.
[6] Includes one-half of the resource of 2.054 Bbbls from Northeast National Petroleum Reserve - Alaska (this amendment) and one-half of the resource of 1.260 Bbbls from Northwest National Petroleum Reserve – Alaska at $30 per bbl. Also includes 2.0 Bbbls from unnamed satellite fields. No economic resource estimates for BLM defined plays were available for the Southern Planning Area of National Petroleum Reserve – Alaska.
[7] The midpoint of the $20 to $30 per bbl estimates for the 2000 Beaufort Sea Assessment.
Sources: USDOI BLM and MMS (2003), USDOI MMS (2003c), and AOGCC (2004).

From an historical standpoint, only about one-third of the federal sales originally scheduled in the Beaufort Sea were held, and only a small fraction of the tracts offered in the sales were leased (less than 7 percent). Few of those leases were actually tested by drilling (30 wells on 20 prospects). Most discoveries (11 wells determined to be producible) were too small or too costly to become viable fields. One field (Northstar, discovered in 1984) started production in 2001, while another (Liberty, discovered in 1982) is being considered for development.

The BLM held lease sales in the Planning Area in the early 1980s. Recent lease sales by the BLM include leasing 133 tracts in 1999, and leasing an additional 60 tracts in 2002. ConocoPhillips has drilled 13 wells, with announced discoveries of gas, oil, and condensate in five or six wells. British Petroleum has drilled two wells, and Anadarko has drilled one well, but neither company has made any announcements regarding the producibility of these wells.

The BLM held an oil and gas lease sale on June 2, 2004, for 484 tracts in the Northwest National Petroleum Reserve – Alaska, and for 22 tracts that combine lands from the Northwest and Northeast National Petroleum Reserve – Alaska along the Ikpikpuk River that had not been offered previously. About 5.8 million acres were offered. Five companies submitted bonus bids totaling $53,904,491 to win rights to develop 123 oil and gas lease tracts. The single largest bid was $13,745,000 for tract D-19 near the Ikpikpuk River. The BLM may also hold lease sales in the Planning Area in 2005, depending upon the outcome of the Amended IAP/EIS.

4.7.3.8 Infrastructure and Transportation

Production of any North Slope petroleum reserves would not occur without a means of exporting the production to market. The transportation infrastructure system for any project includes four components: pipelines from the production pads to a CPF, pipeline from the CPF to TAPS, TAPS from Prudhoe Bay to Valdez, and seagoing tankers that travel from Valdez to ports on the west coast of the U.S. and in Asia.

Given the decline of production in existing Prudhoe Bay fields, the existing oil transportation system (including TAPS) is expected to be able to transport oil produced by development of new reserves on the North Slope, as well as additional enhanced recovery from the Prudhoe Bay fields during the cumulative analysis period. New fields would use infrastructure at the edge of the core area to transport processed crude oil to the TAPS pipeline. This existing infrastructure at the edge of the core area includes the Western Group (including existing Alpine, Kuparuk, and Milne Point infrastructure), which would accommodate new production from the National Petroleum Reserve – Alaska; the Central Group (including Northstar and other fields near the Beaufort coastline); and the Eastern Group (including numerous discoveries in the Point Thomson area and adjacent offshore; see Map 3-3).

Currently, the TAPS terminal at Valdez handles about 1 MMbbl of crude daily. At peak production, the Northeast National Petroleum Reserve – Alaska would produce from 14 to 77 MMbbl of crude oil annually under the final Preferred Alternative (Table 4-5). The daily production rate of 148,000 barrels per day (54 MMbbl annually for the $25 price case under the final Preferred Alternative) from the Planning Area would be approximately 15 percent of the current throughput of TAPS, and 7 percent of the peak throughput of TAPS. Estimating future production on the North Slope (including offshore) at the high end of projections, oil tankers still could be moving this daily amount of oil (about 1.0 MMbbl) from Valdez in 2009.

The cumulative impacts of operating the TAPS transportation system were evaluated in the recent Final EIS for Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way (USDOI BLM 2002). These impacts included consideration of continuing use of the crude oil transportation system to transport current and future production. It also considered the probability and consequence of spills from various elements of the system. The conclusions about the cumulative impacts associated with transportation of crude oil from the North Slope presented in the TAPS Renewal FEIS are equally applicable to this amendment, and are incorporated into this cumulative analysis. A copy of the TAPS Renewal EIS can be reviewed on-line at http://tapseis.anl.gov/; the findings are summarized below.

The TAPS Renewal FEIS made the following conclusions on impacts from continued operation of the pipeline and tanker transportation system:

- Paleontology, Air Quality, Transportation, Waste Management, Terrestrial Vegetation and Wetlands, and Cultural Resources – TAPS would have no or a very minor impact.
- Soils and Permafrost – Increased throughput could expand thaw bulbs and ground settlement near TAPS. Reduction in throughput could cause frost heaves. Overall, TAPS would be a minor contributor to cumulative effects related to soils and permafrost.
- Sand, Gravel, and Quarry Resources – The TAPS would be a minor contributor to requirements for these resources.
- Surface Water Resources – Impacts to surface waters would be localized unless an oil spill occurred, in which case impacts could be substantial. The TAPS operation would have a very small effect on surface water quality.
- Groundwater – An oil spill from TAPS or oil development activities could impact groundwater quality to a small or large extent, depending on the spill's size, and location, and the effectiveness of response activities.
- Physical Marine Environment – The marine environment could be affected by spills from tanker and other forms of marine transportation in Prince William Sound or along Pacific transportation routes. Reasonably foreseeable spills would be small, rapidly cleaned up, and of local consequence. Larger, less probable spills could take longer to clean up and result in widespread contamination of the marine environment.
- Noise – All activities would have the potential to produce local impacts on noise.
- Human Health and Safety – No substantial health impacts would be expected from the inhalation of industrial air emissions in the Valdez area. The Valdez Marine Terminal operations contribute to, but are not the sole source of, organic air pollution emissions in the Valdez area. The general public would be exposed to more

vehicle emissions over the next 30 years unless additional controls were placed on such emissions. Accidental releases of hazardous materials and spills into the marine environmental also could have small impacts on public health.

- Fish – Risks of large spills with large consequences would be minor; however, a major spill into a waterway could be severe and possibly long term.
- Birds and Terrestrial Mammals – Impacts from many activities could be large in local areas but would be minor on the population level.
- Threatened, Endangered, and Protected Species – Impacts are anticipated to be negligible to minor and are not anticipated to threaten population viability, unless a low-probability, high-volume spill from oil transportation occurred in Prince William Sound or along Pacific transportation routes. Such a spill might cause impacts that would be high on a local level.
- Subsistence – There would be minor impacts on subsistence, except on the North Slope where impacts would be moderate. Contributions from TAPS to these cumulative impacts are expected to be relatively small.
- Sociocultural Systems – In sociocultural systems founded on cooperation and subsistence, cumulative impacts might accompany their continued interaction with modern American society and the continued growth in the importance of a cash economy. However, these changes occurring throughout Alaska are not attributable solely to cumulative actions considered in the EIS. The contribution of TAPS to these cumulative impacts would be relatively small.
- Land Use and Coastal Zone Management – The contribution of the TAPS operation to these cumulative impacts is expected to be relatively small. However, an oil spill to marine waters from marine transportation or from oil production could impact implementation of Coastal Management Plans.
- Recreation, Wilderness, and Aesthetics – Oil or gas spills associated with TAPS operations could impact recreation, aesthetic, and wilderness values. Because spills could result in long-term impacts, aesthetic impacts along TAPS could be major.
- Economics – Continued production of North Slope petroleum reserves, including transportation, would make a substantial, though declining contribution to domestic oil production and would continue to reduce the need for foreign oil imports, thus improving national energy security and the overall balance of trade. Substantial federal tax revenue would be generated with continued TAPS operation, together with marine and shipbuilding employment and employment in the economy as a whole.

Tanker Traffic and Routes

On November 28, 1995, President Clinton signed legislation (30 USC 185[s]) that authorizes the overseas export of crude oil from Alaska's North Slope in U.S. flag tankers, unless the President finds exports are not in the national interest. Tankers traveling to the Far East could carry up to 1.8 MMbbl each; however, such estimates are highly speculative because they depend on opportunities for short-term contracts. The route to the Far East would bring the tankers more than 200 miles offshore of the Aleutian Islands, a distance that should protect the biological resources of the Aleutian Chain from pollution. This traffic is in addition to current LNG shipments from an LNG plant at Nikiski, Alaska. Every 10 days, the Nikiski plant loads a tanker with 80,000 cubic meters of LNG for Tokyo, which it has been doing since 1968 without a major incident. Because LNG boils off and disperses quickly when exposed to normal air temperatures and winds in the North Pacific, it is not a major environmental threat along the tanker route.

Transportation for "Roadless" Development

The 1998 Northeast IAP/EIS prohibited permanent roads connecting the Planning Area to outside infrastructure. Lease Stipulation 48 for Northeast IAP/EIS ROD states, "Permanent roads (i.e. gravel, sand) connecting to a road system or docks outside the Planning Area are prohibited, and no exceptions may be granted" (USDOI BLM and MMS 1998). Planned oil development projects grouped around the Alpine oil field are not expected to have

permanent gravel roads connecting to the Kuparuk River Unit road system. Transportation to these fields would use aircraft and marine vessels in summer; in winter, ice roads also allow the use of vehicles. As discussed below, however, the Army Corps of Engineers is preparing to assess the impacts of a proposal from the State of Alaska that would build an all-season gravel road between the Spine Road of the Kuparuk River Unit to Nuiqsut.

Colville River Road from Kuparuk River Unit to Northeast National Petroleum Reserve – Alaska

The State of Alaska's Industrial Roads Program, also known as "Roads to Resources," began in March 2003 as part of the Northwest Alaska Transportation Plan, after transportation analyses showed that new North Slope oil field roads would accelerate development and provide important revenue/employment opportunities.

As part of the Industrial Roads program, the Alaska Department of Transportation and Public Facilities (ADOTPF) is planning to construct an all-season gravel road to the eastern edge of the Planning Area. The ADOTPF has been studying several routes. The primary candidate is an 18-mile route that would exit the Spine Road at the western terminus (near the Tarn development) of the Kuparuk field road system and proceed westward to a new bridge crossing of the Colville River 3 miles south of Nuiqsut. The route would require the construction of a 3,300-foot bridge across the Colville River. The road would be 32 feet wide built on a 5-foot thick base of gravel. As reported in *Petroleum News*, the road would be capable of handling all ordinary industrial loads, including drilling rigs (Nelson 2003).

Public access to the proposed road has not been determined. At present, oil and gas producers have concerns about security. Section 118(e) of the Transportation Enhancement Act – 21 (TEA-21) authorizes the expenditure of federal funds for resource development road construction projects without regard to the traditional "public funds equals public access" caveat. The TEA-21 allows industrial use designation of these roads that precludes or limits public access, even though state or federal funds are used. The ADOTPF is investigating the full implications of this statute on the North Slope roads development program currently underway. It is as yet unclear whether the proposed North Slope road would be open to public use.

The proposed road is expected to stimulate oil and gas development on state lands and in the National Petroleum Reserve – Alaska, and provide cheaper transportation of materials and supplies to Nuiqsut. The road and bridge would enable oil and gas companies to develop staging areas on the west side of the Colville River and access points beyond via ice roads. The ADOTPF has also indicated that it is in the initial planning stages for a mainline road from the proposed Colville River bridge into the National Petroleum Reserve (Nelson 2003), but a route has not been developed.

A permit application for this route has been submitted to the USACE by ADOTPF and an EIS was to have been prepared during 2005. In late 2004, however, the State of Alaska put the project on hold pending review of other potential route options between the Dalton Highway and the Planning Area.

4.7.4 Advances in Technology

When exploration of the North Slope began, knowledge about of the effects of exploration and construction techniques on permafrost was limited. From early exploration through the 1950s, trails often were cut directly into frozen ground. Large tractors and tracked vehicles traveled over thawed ground in the summer, often leaving deep ruts, and sometimes road builders removed the vegetation mat completely, causing deep thermokarst (Bliss and Wein 1972, Hemandez 1973, Chapin and Chapin 1980). Trails commonly became wetter than the natural habitat and were colonized by species more adapted to wet sites. Higher biomass and changes in nutrient concentrations occurred in the trails (Chapin and Shaver 1981). At times, subsidence and erosion created trails as deep as 16 feet (Lawson et al. 1978). Some old trails and seismic surveys made by government contractors in the 1940s are still clearly visible because they are deeply rutted, often flooded, and filled with vegetation that is quite different from the surrounding tundra (Hok 1969, 1971; Lawson et al. 1978).

In the 1960s, peat roads were built by scooping the active layer from two sides of an area and piling it in the center to form an elevated surface. This method also resulted in severe thermokarst. By the 1970s, gravel had replaced peat in road construction. Now in many cases, ice is used.

Over the past 2 decades, new technologies have been developed and applied to exploration, development, and production on the North Slope. Some technologies, such as the use of ice roads and ice pads for exploration wells and the Arctic Drilling Platform, are unique to the Arctic and were largely developed in Alaska. Other advances, such as the use of coiled tubing, 3-D seismic-data acquisition, horizontal and multilateral drilling, measurement while drilling, low ground-pressure vehicles (Rolligons), and remote sensing, were developed elsewhere and adapted for use on the North Slope. Although some of those newer technologies have been used extensively, and the newer fields (such as the one at the Alpine field) use them almost exclusively, older technologies are still integral parts of the older portions of the Prudhoe Bay and Kuparuk fields. An understanding of the development and use of newer technologies is important in understanding what effects to resources accumulate on the North Slope, and the likelihood and magnitude of these effects in the future.

4.7.4.1 Seismic/Off-road Travel/Exploration

The new exploration-related technologies reduced the overall use of gravel and presently eliminated it from the exploration-drilling process, provided data for better siting of facilities, and reduced the number of wells required to find and evaluate a new field. Although the physical effects have been greatly reduced by the use of these technologies, there are still valid concerns regarding the potential for some amount of damage to the environment.

The environmental effects of the older road and pad construction techniques and seismic trails are matters of concern. In some instances, the effects have not diminished with the passage of time; in others, a natural but slow recovery is occurring. The visual impact, in some cases, will be evident for years, if not for decades.

The density of 3-D seismic activities can cause short-term visual impact. In areas where there is little snow cover or steep vegetated terrain, damage to the tundra and shrubs can be locally significant and long lasting. Long-term studies of the trails built for the closely spaced 3-D acquisitions are required to document the potential effects. Improvements in 3-D seismic-data acquisition and other exploration technologies allow geologists to identify higher quality prospects and to improve success rates by as much as 50 percent or more. In 1970, the success rate for exploration wells in the U.S. was about 17 percent. In addition to the advances in data quality and acquisition procedures, there have been important advances in the engineering of the vehicles used to move the camp equipment and to acquire the data. The major changes have been in the development of new "light-weight" rubber tracked caterpillar-type vehicles and vibrators that do less damage to the tundra and shrubs than the older vintage steel-tired vehicles. With the use of 3-D seismic-data acquisition, success rate increased to 48 percent in 1997 (USDOE 1999, Revkin 2001).

Three-D seismic technology was introduced about 25 years ago. Data, acquired in a grid-like manner with the individual lines spaced only a few hundred feet apart, are computer manipulated to create multidimensional representations of the subsurface. The result is a far better understanding of the geologic structures and continuity of the potential hydrocarbon-bearing formations. As with the older generation 2-D seismic data, onshore 3-D seismic data are acquired during winter, after freeze-up. Vibrators are used and these energy sources and the crews, camps, and other support facilities are carried on and/or are usually towed by low-impact tundra travel vehicles (Lance 2000). Most offshore 2-D and 3-D seismic data are acquired during the open water season using airguns rather than vibrators. Some offshore data, in the area of bottom-fast ice, are acquired during winter using land technology.

The older, land-based 2-D seismic technology consisted of long, intersecting seismic lines that used either dynamite or vibrators as the energy source. In the early stages of acquisition on the North Slope, much less care was taken to protect the tundra from damage during data acquisition. Damage, then as now, can result from inadequate snow cover and inappropriate equipment.

Offshore seismic data are acquired using patterns and spacing similar to those used in onshore acquisition. These data can be acquired only when the sea is relatively ice-free and boats can maintain long uninterrupted traverses. A high noise level is associated with marine acquisition, and it negatively affects marine organisms, especially whales.

Four-D visualization adds the element of time to 3-D seismic databases. A reservoir's fluid viscosity, saturation changes, temperature, and fluid movements can be analyzed by time-lapse monitoring in three dimensions (USDOE 1999). The time-lapse picture is built out of data re-recorded, compared, and plotted by computer onto the 3-D model. Additional data, such as well logs, production information, and reservoir pressures, may be integrated into the time-lapse imagery. The resulting information provides geologists and others with data that are valuable for both exploration for and management of existing resources. The exploration element comes from the greater ability to predict the best locations for exploratory drilling.

The 3-D seismic-data acquisition and 4-D visualization technologies provide a number of environmental benefits (USDOE 1999). They include more accurate exploration well-siting that reduces the number of dry holes, the number and length of ice roads, and the number of ice pads that have to be built; generation of less drilling waste and decreased volumes of materials, thereby lessening the possibility of a spill or other accident; better understanding of flow mechanics so that less water is produced relative to oil or gas; and increased ability to tailor operations to protect sensitive environments. Overall, fewer wells are required in order to evaluate and produce the reserves.

Nonetheless, considerable concern has existed regarding the effects of any seismic activity conducted either on land during winter or at sea during the open water season (Van Tuyn 2000). Land-based seismic-data acquisition with its large vehicles and numerous traverses across the tundra has left scars of the vehicle paths, some of which have been slow to heal and recover. At sea, migrating bowhead whales have been deflected by noises generated by seismic exploration and drilling.

The 3-D seismic-data acquisition programs require more closely spaced grids, a few hundred feet between lines as opposed to several thousand feet with standard 2-D seismic programs. This closer spacing has the potential to affect a greater amount of the tundra surface. These trails are often highly visible the following summer, in part because the old dead vegetation has been flattened by the vehicles and the green new vegetation can be more readily seen in sharp contrast to the undisturbed surrounding areas.

The closer spacing of the seismic traverses may also increase the risk that denning polar bears may be disturbed. This risk could be lessened by studies of bear denning sites and planning the acquisition programs accordingly.

Ice Roads and Pads

Arctic tundra is easily disturbed and slow to recover from damage. Disruption of tundra may also have a pronounced effect on permafrost and result in thawing and erosion. Historically, roads to exploration well sites were built of peat, bladed bedrock, or gravel, causing long-term damage to tundra that remains evident after 40 or more years. Drilling pads were similarly built of gravel or bulldozed bedrock in some areas of the National Petroleum Reserve – Alaska during the Navy exploration efforts in the 1940s and 1950s. Because of these factors, and potential damage from transporting equipment across the tundra either in the summer or winter, ice roads have replaced gravel roads and have become the means of access to isolated drilling locations. In a similar fashion, ice pads have become the standard for exploration drilling sites, eliminating the need for gravel to build pads and cleanup after drilling. All onshore exploration drilling is done during winter and all materials necessary for drilling a well, including the drilling rig, are moved to and from well locations on ice roads.

An ice road 6 inches thick and an average 30 to 35 feet wide, would require 1 million to 1.5 million gallons of water per mile of length (Van Tuyn 2000); ice roads on the North Slope are generally 12 to 18 inches thick. Frequently, exploration activity within a specific area requires more than one drilling season; therefore, more than one ice road may be built from the staging area(s) to the same drilling site or prospect. To avoid possible damage

from multiyear usage of the same area, any subsequent ice road is offset by at least a road width from previous ones.

A 6-acre drilling pad, 12 inches thick, would require approximately 500,000 gallons of water (Van Tuyn 2000). The ice pads provide a solid, stable base from which to drill an exploration well. Upon completion and abandonment or testing of the well, the rig and all support facilities are moved off location and the pad is allowed to melt. The result is a very low impact operation, and usually the only indication of the drilling activity is the abandoned wellhead.

In special situations, specifically where drilling and evaluation are expected to require either an extended drilling season or two drilling seasons, insulated ice pads have been utilized. Although insulated ice pads have not been used in recent years on the North Slope, BP Exploration used such a system when drilling the Yukon Gold No. 1 and Sourdough No. 2 wells in the 1993-1994 drilling season (USDOE 1999). A 190- by 280-feet ice pad was built in March 1993 and covered with wind-resistant insulating pads. The pads remained in place over the summer and were removed in October. Drilling began in mid-November, 2 months ahead of conventional Arctic practice. With this advanced drilling start, the Yukon Gold well was completed, and the rig moved to the Sourdough site and the well completed, all in the same season. This would have been impossible with a conventional ice pad.

There is the potential for some level of short-term damage in areas that have either experienced low snow fall or removal of snow by high winds, thus creating substandard snow cover conditions. However, in most instances, there is little evidence of either the ice road or ice pad once the snow cover is gone.

The use of ice road and ice pad technology reduces the need for gravel during the exploration phase of oil and gas activity. Smaller volumes of gravel are mined during the history of a given field, less area is covered by gravel, and there is little recognizable damage to the tundra. The use of an insulated pad allows the drilling of more wells in a single season, reducing the need to build ice roads in two seasons to serve the same general area.

The older technologies had greater potential to seriously disrupt tundra, thaw permafrost, and mar the viewscape. These effects can persist for many years and many damaged sites have not been adequately remediated. Although the use of ice roads and pads has largely eliminated those problems, a different set of potential effects has been identified. Insulated ice pads have some degree of influence on the underlying tundra, because the area loses a growing season, but these effects have not been studied.

The construction of ice roads and pads relies on a ready and plentiful supply of water. Water is withdrawn from rivers or lakes, and existing ice is crushed or chipped and spread along the prescribed roadway or pad site. Concern has been expressed that the extraction of such large volumes of water may endanger fish and drinking water resources. Areas such as the Arctic National Wildlife Refuge have low lake densities and a reliable source for water to build ice roads/pads may not be present. At this time, there are few reliable data that address the controversy over the appropriate use levels for water in the construction of ice pads/roads.

Rolligons and the Arctic Drilling Platform

Potential problems associated with exploration drilling in areas with limited freshwater supply or shortened ice road seasons may be alleviated by the use of low ground-pressure vehicles (Rolligons) and the Arctic Drilling Platform. Rolligons can extend the drilling and off-road seasons on the North Slope. Current Rolligons put 4 to 5 pounds per square inch (psi) of footprint pressure on the tundra, only 1 psi per tire depending on the load and the tire size (Rolligon Corporation 2004, Petroleum News Alaska 2002). The vehicles have been used to move drilling rigs to remote locations on the North Slope. Their primary use would likely be to access locations that are far from current infrastructure and where the economies of the operation favor their use over the costs and the associated delays of building an ice road.

The Arctic Drilling Platform is adapted from offshore technology to use on land. The platform is light, mobile, self contained, and elevated. It can eliminate or reduce the need for ice roads or ice pads (Petroleum News Alaska

2002) and can serve as a temporary drilling facility or a long-term production facility. It is supported by steel pilings that contain coils for circulating hot or cold fluids. The elevated platform consists of interlocking aluminum components (12.5 feet by 50 feet) with reinforcing elements, and rests on a base of shallow containers that capture any deck fluids or other spillage. The components are transported by Rolligons, thus eliminating the need for ice roads, as well as ice pads. This platform is most appropriate where shallow wells are drilled.

Seismic exploration is expanding southward into the foothills of the Brooks Range. Current technology and regulations governing seismic-exploration permits and other off-road travel have reduced but not eliminated damage to the tundra. The nature and condition of permafrost in the foothills is poorly characterized, and the hilly topography increases the likelihood that vehicles would damage vegetation, especially on knolls and riverbanks, causing increased erosion, exposing bare soil, and creating thermokarst. In addition, future exploration would be carried out in a climate that is likely to continue to warm, with milder winter temperatures and shorter periods of freezing. It is hard to predict the consequences of vehicular traffic in winter on tundra under these altered conditions.

4.7.4.2 Drilling and Completion Technologies

An oil reservoir is part of a porous and permeable layer of rock in which the oil is trapped. On the North Slope, each production well is designed to produce from a subsurface area of at least 80 acres. Wells are located on gravel pads and are drilled vertically through approximately 2,000 feet of permafrost. Once through the permafrost, the bit is directed toward the desired bottom hole location. The number of wells per pad generally ranges from 16 to 40 (BP Exploration Alaska, Inc. and ARCO Alaska, Inc. 1997). The size of the pad and associated facilities is largely governed by the spacing between wells, and the number of pads is a function of the size of the area that can be drained by the wells on a pad. Historically, production wells were either straight or deviated holes and the number per pad was limited; hence, the number of pads needed to drain a specific area was high. The lateral reach of deviated holes rarely exceeded the true vertical depth (TVD) of the well. New technologies have done much to improve the lateral reach of a well and to reduce the size and number of well pads.

The technologies developed over the last 2 decades have greatly reduced the size of the footprint left when developing an oil field. Wells may be much more closely spaced, far larger areas developed from a single small pad, the mud systems are less toxic, and reserve pits have been eliminated.

Coiled Tubing

The use of coiled tubing is particularly valuable in sensitive environments such as the North Slope. Coiled tubing technology is quieter and has far less impact on a drilling site than conventional equipment (USDOE 1999). The technology dates from the 1950s, but only after rapid technological advances in the late 1980s did it come into common use. The tubing is mounted on a large reel and is a continuous flexible coil that is fed into the hole. The use of coiled tubing does not require the repeated "tripping" out of the hole to add additional pipe segments. One of the byproducts of coiled tubing drilling is a significant reduction in the volumes of drilling fluids compared with conventional drilling. Coiled tubing mud volumes are commonly less than half those required or generated by conventional drilling practices. In many wells, conventional methods are used to drill the initial hole and then coiled tubing is utilized to drill horizontal segments or multilateral completions. The coiled tubing technology is also commonly used for slim-hole drilling (i.e., a rotary borehole of 5 inches or less, or a drill hole of the smallest practical size) and reentry projects.

The use of coiled tubing technology has substantial environmental advantages over the conventional drilling technology. The primary benefits include: reduced mud volumes and drilling waste; cleaner operations, no connections to leak mud; reduced operations noise; minimized equipment footprints and easier site restoration; reduced fuel consumption and emissions; reduced risk of soil contamination due to increased well control; and better well-bore control. These advantages clearly support the use of coiled tubing whenever it is technically feasible. Many of the newer fields, such as the Alpine field, use this technology almost exclusively in conjunction

with extended-reach horizontal drilling. No detrimental environmental effects are known to be associated with the introduction of coiled tubing technology to the North Slope.

Horizontal Drilling

Horizontal drilling became a reality in the 1970s due to advances in computers, steerable down-hole motor assemblies, and measurement-while-drilling tools. A horizontal well is drilled from an initially vertical well-bore at an angle between 70° and 110°. Vertical, or near vertical wells, drain oil from a single hole and have limited contact with the oil-bearing interval (usually limited to the vertical thickness of the rock unit). Horizontal wells penetrate the formation up to 5 miles or more from the vertical well bore, allowing more oil to drain into the well.

The results are a greater number of wells per pad, closer well spacing on the pad, and fewer well pads than using the old technology. Well spacing has decreased from 120 feet or more to as little as 10 to 15 feet between wells (BP Exploration Alaska, Inc., and ARCO Alaska, Inc. 1997). Pad size and radius of reach of the wells on the pad have undergone remarkable changes since the start-up of the Prudhoe Bay field in the 1970s.

The marked increase in drillable area per pad, as demonstrated at the Alpine field, is largely due to the extensive use of horizontal drilling technology. The environmental benefits include smaller footprints requiring less gravel and fewer wells to produce the same volume of hydrocarbons. These more effective drilling programs require less water and subsequently generate less drilling waste. Horizontal drilling results in smaller and fewer pads than did the older technologies, but gravel is still needed and effects on tundra and permafrost may result from gravel mining and emplacement. The closer spacing of well-bores has the potential to increase the rate at which permafrost thaw bulbs form, reducing surface stability and causing subsidence.

Multilateral Drilling

Multilateral drilling, a variant of the horizontal drilling technology, creates an interconnecting network of separate, pressure-isolated and reentry accessible horizontal or high-angle boreholes surrounding a single major borehole (USDOE 1999). Multilateral drilling is most effective in reservoirs that have isolated accumulations in multiple zones, have oil above the highest perforations, have lens shaped pay zones, are strongly directional, contain distinct sets of natural fractures, and are vertically segregated with low transmissibility.

The environmental benefits are similar to those achieved with horizontal drilling and include fewer drilling sites and smaller footprints, less drilling fluids and cuttings, and protection of sensitive habitats and wildlife. Multilateral drilling poses no additional recognized risks to the environment other than those associated with horizontal drilling.

Measurement-While-Drilling (MWD)

Conventional down-hole logging practices consist of running a variety of remote sensing tools down a borehole prior to setting the surface casing, before any intermediate casing strings, and prior to completing the well at total depth. These tools are attached on wire-lines and are lowered into the uncased hole and pulled back to the surface. The tools record specific types of data as they are withdrawn from the hole. These data are then used to evaluate the rock type, reservoir properties, hole integrity, and the other features concerning the physical environment of the well-bore. The procedure is routine, but it can be a risky because irregularities in the hole can result in stuck or even lost tools. Conventional logging can be especially risky in a highly deviated or horizontal hole where there is an increased probability that the tool, while being pulled out of the hole, may become snagged on a resistant rock projection or become buried by loose debris collapsing into the hole.

Additionally, these important data are not available to the geologist until some time after the well or interval has been drilled. This delay may vary from hours to days or even weeks. An example would be the desire to correlate the drilled section with that seen in a well some distance away, in order to predict a coring point or anticipate stray high-pressure sandstone.

Measurement-while-drilling (MWD) technology can provide data virtually as the intervals are drilled. Additionally, sensors provide directional information and other key data that facilitate more effective geosteering and trajectory control (USDOE 1999). The recording sensors and other necessary equipment are housed in the drilling assembly at the bottom of the pipe-string, just a few feet above the drill bit.

Because of its real time capability, the MWD technology can be used to avoid formation damage by alerting the rig crew of problems before they become too serious to correct; similarly there is a reduced possibility of blowouts and improved overall rig safety. This technology is also a contributing factor in the reduction of drilling waste volumes because it facilitates horizontal and multilateral drilling practices and provides better well-bore directional control. The technology also reduces the potential for loss of a tool assembly, reducing waste and shortening the duration of the drilling process.

Light Automated Drilling System (LADS)

As discussed earlier, the construction of ice roads and ice pads in remote areas requires an abundant water supply. There is legitimate concern regarding means of access in areas that lack sufficient water and/or fresh-water ice to build roads or if global climate change were to prevent the use of ice roads.

A possible solution to this problem, the Light Automated Drilling System (LADS), is in the research phase and is being considered for use on the North Slope. This potential drilling system is expected to be a light-weight drilling rig that can be easily broken down into several components and transported across tundra in winter by light impact vehicles that would not require ice roads. This system, or others like it, could be adapted to work in areas that lack sufficient water for ice roads or during mild winters when it would not be possible to build an ice road, transport a rig to a drilling location(s), and return it to the staging area.

The principle benefit of LADS would be to reduce the need for water to build ice roads. The primary drawback from the environmental perspective would be the increased risk of damage to the tundra while transporting rigs between locations in the absence of adequate snow cover. The same concerns exist as are presently expressed for seismic activity, but on a much reduced scale.

4.7.4.3 Development and Production

Production and associated operations are the longest-term activities in an oil field. The life of major oil fields on the North Slope could be expected to be on the order of 30 to 40 years, occasionally as much as 50 years. During this time pipelines, production facilities, waste disposal systems, water treatment plants, injection facilities, road systems, and other specialized units continue to operate.

Industry attempts to produce the maximum amount of oil/gas at the least cost in order to remain competitive and viable in the event of competition for funding or a low oil/gas price environment. The most cost efficient technologies are the obvious choice of the operators. It is not surprising that in the early phases of development and production some of these choices have proven to be less than optimal from an environmental perspective. The use of reserve pits for the disposal of used drilling muds, cuttings, and other waste is one such example.

Today, on the North Slope, as fields continue to be discovered, developed, and produced, there continues to be the need for new pipelines, production facilities, waste disposal wells, etc. To reduce the environmental effects of these activities, new technologies have been developed or adapted for use on the North Slope. New methods do not eliminate the need for gravel, water, and other materials, but they reduce their use and cause fewer disturbances, therefore reducing the potential negative effects associated with wastes and road and pipeline construction.

Enhanced Oil Recovery

This technology involves the injection of formation/source water, natural gas, and miscible fluids into the producing reservoir to maximize recovery of hydrocarbons. In this process, not only is more oil recovered per well, but much of the waste water associated with oil production is reintroduced into the reservoirs from which it was

produced. Many problems that formerly were handled by surface or reserve pit disposal techniques are solved.

The principal environmental benefits are greater recovery of oil without a proportionately greater number of wells and their associated waste, environmentally friendly disposal of produced water, and reduction of emissions that would be associated with the flaring of excess produced gas. Few negative environmental effects are associated with Enhanced Oil Recovery. The primary concern is in regard to spills of produced water and the remote possibility that a reservoir may be over-pressured through the injection process, causes fracturing to the surface, and allows oil and other fluids to escape to the pad and/or tundra.

Waste Disposal

From the 1940s to the 1980s, most well-associated wastes were either stored in reserve pits or handled through other surface disposal means such as incineration. The reserve pits were prone to seepage and spills, and they contained undesirable metals and volatile organic compounds. These did, and still do present environmental risk, especially at old, unclosed remote exploration sites.

The reserve pit closure program was instituted in 1996. To date, 50 percent of approximately 600 reserve pit sites have been closed. Down-hole disposal of wastes by injection into subsurface disposal intervals is utilized in all present-day exploration wells and producing fields. This mode of waste disposal is an effective and non-contaminating method of removing many unwanted materials from the surface environment. The grind-and-inject project was undertaken to dispose of drilling muds and cuttings stored in reserve pits. Other wastes processed through the grind-and-inject plant includes Class II, RCRA-exempt oily wastes, and drilling muds and cuttings from ongoing drilling operations.

Annular injection is an environmentally safe method of disposing of drilling muds and cuttings, and the injection of Class I and Class II materials into discrete disposal zones has provided a mechanism for the handling of produced formation waters and other associated wastes (NRC 2003). However, a large number of unclosed reserve pits remain at remote exploration well-sites. No adequate plan is in effect to handle the possible pollution and resultant damage from poorly sealed and covered pits. The annular injection process has some potential to create or take advantage of poor casing or cement jobs and result in leakage to the surface. This has occurred on several occasions, but with no contamination of permafrost. Worries regarding subsidence and marine contamination have been expressed, but the existing evidence indicates that subsidence is not a concern and disposal units are effectively and naturally isolated from any contact with the ocean or seafloor.

Gravel Use and Roadless Construction

Gravel in the area of Alaska north of the Brooks Range has been used for a variety of construction and maintenance purposes. These historical uses include construction of the following:

- Dalton Highway/Haul Road in support of the development of the North Slope oil fields and TAPS;
- Pads for camps, exploration drilling, development and production drilling sites, and operations and maintenance facilities;
- Airports in oil field areas and in the communities of the NSB;
- Roads in oil field areas and in the communities of the NSB;
- Man-made islands for offshore exploration drilling and for development and production facilities;
- Docks and causeways; and
- Beach nourishment in several of the NSB communities.

From 1974 to 1999, more than 205 million tons of gravel was mined to meet the industrial and community construction and maintenance needs in the area that includes the Brooks Range, the area north of the Brooks Range

to the Beaufort Sea coast (the North Slope), the Chukchi Sea coast north of Cape Krusenstern, and NSB communities (NRC 2003). Most of the gravel was mined from the floodplains of rivers. About 180 million tons of the gravel (88 percent of the total) was mined from 1974 to 1985. During this time, the Haul Road/Dalton Highway and pads, roads, and airfields were constructed for the facilities to develop the Prudhoe Bay, Kuparuk River, Lisburne, Milne Point, and Endicott oil fields. From 1986 to 1999, the amount of gravel mined annually in the Northern Region ranged from 0.56 to 4.5 million tons.

The portion of the oil-field network that is connected by roads stretches to 60 miles from the Endicott field in the east to the Tam oil field in the west. Most of the expansion of the road network was done before 1988, the development phase of the field, during which the rate of growth was about 24 miles per year. Since 1988, the rate of growth in the road network has been about 3 miles per year (NRC 2003).

The total gravel-covered area increased from about 20 acres in 1968 to about 9,200 acres in 2001 (Table 4-37). The rate of gravel placement declined noticeably after 1988, because the main road network and most of the pads in the Prudhoe Bay and Kuparuk oil fields had already been built. The average rate of growth was 780 acres per year before 1988 and 57 acres per year after 1988. Most of the gravel-covered areas are associated with onshore drilling and construction pads.

Offshore gravel islands support production operations. The Endicott islands are connected to each other and to the mainland by a 5 mile causeway and are situated in waters generally less than 7 feet deep (AOGA 2001). The shallowness of the Beaufort Sea in the Prudhoe Bay prevents large vessels from docking there. Three gravel causeways were constructed to facilitate docking, to provide access to artificial-gravel production islands, and to draw seawater for waterflooding.

The ADFG, Habitat and Restoration Division, developed guidelines for siting, design, operation, and reclamation of North Slope gravel pits. The area disturbed by gravel mines and fill placement is a fraction of the area north of the Brooks Range. The North Slope covers about 57 million acres, and the ACP covers about 13 million acres (Gilders and Cronin 2000). The area that would be disturbed by gravel mines and fill placement in 2030 is projected to be about 22,596 acres, or about 0.17 percent of the ACP (Table 4-37).

Table 4-37. Past, Present, and Reasonably Foreseeable Future Production and Development Total Disturbed Areas for the North Slope (in acres).

	1968	1973	1977	1983	1988	1994	2001	2010[1]	2030[2]
Gravel footprint areas	20	1,713	3,288	7,022	8,681	8,920	9,225	9,910	12,866
Other impacted areas[3]	308	1,388	1,552	1,694	1,698	1,753	1,765	1,900	2,460
Gravel mines	25	4,766	5,146	5,756	6,241	6,246	6,364	6,430	6,830
Dalton Highway	332	332	332	332	332	332	332	332	332
Proposed road from Kuparuk to Nuiqsut	0	0	0	0	0	0	0	108	108
Total disturbed area	685	8,199	10,318	14,804	16,952	17,251	17,686	18,680	22,596

[1] Includes disturbed areas associated with the Alpine Satellite Development.
[2] Assumes development projected to occur under the Alpine Satellite Development Plan full-field development and disturbed areas under the Amended IAP/EIS final Preferred Alternative.
[3] Disturbed area around gravel pad, peat roads, tractor trails, exploration roads, gravel pad removal site, etc.

Surface deposits within the National Petroleum Reserve – Alaska consist mostly of fine-grain clay, silt, and sand. Gravel is located along the slopes of the Brooks Range, the Colville River, and some scattered areas along the Arctic coast. West of the Colville River, gravel sources may become increasingly rare because of the low-relief, poorly drained character of the ACP. Meandering rivers have low energy and a low capability of transporting coarse clastic material (gravel) from higher elevations. The Brooks Range is far from the coast on the western North Slope. Consequently, suitable gravel sources would be far more difficult to locate. Because long hauls are often required to bring in gravel, gravel from existing work/drill sites is reused (Gryc 1985). This lack of gravel

would be an important consideration in the development of permanent oil and gas facilities west of the Colville River. Although there are no specific proposals, there is ongoing discussion about the potential need for inter-community roads west of the Colville River. Such roads would also require large amounts of fill material (gravel and sand), since gravel roads require 60,000 cubic yards per mile.

In general, North Slope gravel usage for oil fields has been declining. Large fields (such as Prudhoe Bay and Kuparuk) that require a large number of production well pads are no longer being discovered. There also is a trend toward consolidating facilities and using technological advances that minimize the surface area disturbed (Gilders and Cronin 2000). Overall, the footprint of oil fields is getting progressively smaller because wells are closer spaced and on-pad structures are minimized. A smaller footprint equates to less gravel use.

Other developments that have reduced the amount of gravel needed to develop or maintain oil and gas production facilities have utilized the following practices:

- Use of ice pads instead of gravel for exploratory well-drilling pads (onshore and offshore in shallow waters, where appropriate);
- Use of mobile steel or concrete bottom-founded structures to drill exploratory wells in shallow waters;
- Use of ice roads instead of gravel roads for pipeline construction;
- Development of fields without a gravel road connection to the Prudhoe Bay/Deadhorse area (Badami and Alpine);
- Reduction of the spacing distance between development wells, which reduces the size of the development pads;
- Use of extended-reach drilling, which reduces the amount of gravel needed to develop new reservoirs that lie near established facilities;
- Recycling of gravel from roads, airfields, or pads that are no longer used; and
- Use of clean drill cuttings in place of gravel.

Future oil field development would be based on refined variants of the Alpine model. Pads would be small and few in number and construction would be largely a winter activity with transportation via ice roads. The use of gravel would be appreciably reduced. However, the scarcity of water in some areas, climate change, and other factors could make use of gravel roads more attractive economically and practically in some areas.

Pipeline Construction and Spill Prevention

Among the standard practices utilized in the construction of pipelines are gravel maintenance and construction roads, elevated river crossings, and block valves to reduce the likelihood and sizes of leaks and spills. Recent developments have lessened the environmental effects of pipeline construction, the hazards to the pipeline due to flooding, the probability and severity of leaks, and impediments to caribou movement. These new approaches were all used in the design and construction of the Alpine field oil pipeline (Lance 2000), which was built largely during the winter using ice roads. The lack of a gravel maintenance road removes one potential barrier to caribou movement, and reduces the volumes of gravel required for the Alpine field-like projects and the amount of tundra impacted by burial.

The Colville River pipeline crossing posed a considerable challenge. During breakup and the associated flooding, the river is almost a half-mile wide and could destroy an above ground pipeline or erode deeply enough to expose and rupture a line buried in a surface trench. ARCO Alaska, Inc., elected to use horizontal directional drilling to position the pipeline deep beneath the river channel (Lance 2000). More than 4,000 feet of pipeline were placed 100 feet below the river.

After conducting an oil-spill isolation strategy study that reviewed ways of meeting federal leak-containment regulations, ARCO Alaska, Inc., elected to use 39 to 46 feet high vertical loops on the Alpine field pipeline in lieu of the more conventional block valves. The study concluded that when used in tandem with emergency pressure-letdown valves or divert valves, vertical loops would contain drain-down-related spills as well as block valves, while offering operations and maintenance efficiencies (Pavlas et al. 2000).

The loops are better than manual block valves for reducing catastrophic failures and they provide protection levels similar to those achieved by remotely-actuated valves for leaks of all sizes. They are not potential leak sites, as valves are, but they do not provide any substantial benefit over block valves for pinhole leaks. With approval from the Department of Transportation, the loops were placed at river crossings and high points along the line.

These new pipeline construction methods greatly reduce the environmental effects on tundra, provide for a safer line, and lessen the probability of spillage due to river-induced pipeline damage. They also more effectively limit the size of catastrophic spills. However, the placement of a pipeline at depth beneath a river could make detection and cleanup of a spill in the buried segment difficult. The preexisting and predominant North Slope pipeline technology presents impediments to caribou movement when in close proximity to roads, and river crossings are sites of potential severe environmental consequences if a spill occurs. The accumulation of effects of continued construction of pipelines and road systems could increase the magnitude of displacement of the calving caribou away from the coastal strip and prime forage/insect-relief areas.

Remote Sensing

Remote-sensing techniques such as infrared photography, have been used to design and locate roads and facilities, such as development facilities and ice roads and ice pads, to reduce effects on the environment. Satellite infrared photography has been utilized to facilitate habitat mapping in the Alpine field (Lance 2000). The environmental benefits come from the avoidance of critical habitat and better design of facilities that must be placed within less than ideal locations. No negative consequences have been identified with the use of this technology.

4.7.4.4 Abandonment and Restoration

The factors leading to a decision to abandon a field can differ for each field, but declining production rates and oil price are usually the two key considerations. Abandonment occurs when the field is no longer economically viable. In the Planning Area, abandonment would not be expected to occur within the life of this plan, as no production has occurred to date, and newly discovered and developed fields are generally economically viable for at least 20 years.

To date, very little abandonment (except for single exploration or development wells) has occurred anywhere on the North Slope. According to the U.S. General Accounting Office (GAO; 2002), as of December 2001, no production pads have been abandoned, as all of the production wells associated with the pad must first be plugged and abandoned, which has not taken place. Restoration of other types of facilities, such as gravel extraction sites and older exploration pads, has taken place at a small scale at several locations on state lands on the North Slope outside of the Planning Area (Jorgenson et al 1992; McKendrick et al 1992; Herlugson et al 1996; McKendrick 1996). These restoration efforts are being closely monitored in an effort to determine the most appropriate and effective methods for restoration.

As the infrastructure ages or is abandoned, other unintended environmental effects can result. Aging increases the likelihood of failure, which can lead to accidental discharges (spills) or to other accidents. Abandoned roads and other structures can degrade from melting permafrost and continue to alter the visual environment, especially if the climate continues to warm.

Most North Slope oil-field equipment dates from the last quarter of the 20th century, and it will continue to age over the next 25 years, the period of this report's scope. Components that could fail include pipelines through corrosion, subsurface safety valves, and safety systems to suppress fires and explosions. The older oil-field areas,

such as Prudhoe Bay, will be most susceptible to aging. Thus, age-related maintenance demands will increase as oil revenues from declining oil fields decrease. As an aging field's production declines and the cost of extracting oil increases, the economic incentive to postpone or eliminate maintenance and replacement will increase. The environmental effects of aging infrastructure will depend on interactions between the economics of declining fields, increased replacement and maintenance costs, the regulatory regime, and other factors equally hard to predict.

The oil industry and many public landowners use the term "dismantlement, removal, and restoration," or DR&R, to refer to dismantlement and removal of infrastructure and restoration of the land following removal activities. The DR&R can range from complete restoration to a natural state approaching original condition to simply removing structures (GAO 2002).

The State of Alaska has adopted general DR&R requirements that contain no specific stipulations on what infrastructure must be removed or to what condition the lands must be restored once oil production ceases (GAO 2002). The state specifies that oil companies must return the land to the condition that is satisfactory to the state, a condition that has not been defined. Other entities, such as the USACE, NSB, and Native landowners, have the authority to impose DR&R requirements, but generally defer to the state to impose these requirements. Under existing funding mechanisms, only a small portion of the funds needed would be available to dismantle, remove, and restore oil and gas facilities. The State of Alaska requires companies to post bonds or other forms of financial assurance as a condition for obtaining a lease and drilling permits. However, companies are required to maintain only $500,000 in assurances to cover all of their leases in the state; it is estimated that it will cost billions of dollars to conduct DR&R for existing infrastructure on the North Slope.

The BLM's overall restoration goal for the National Petroleum Reserve – Alaska is to return it to its previous use, which includes fish and wildlife habitat, after oil production ceases; however, the BLM has yet to develop specific DR&R requirements for companies to use. On the other hand, the MMS, has specific DR&R requirements for offshore drilling. Both agencies have the authority to require full financial assurances to fund DR&R. The MMS has an escalating bond structure that considers, among other things, the future costs of reclamation, increasing the likelihood that future DR&R costs would be covered by the bond.

By the terms of federal and state leases and permits, it is the responsibility of the lessee/applicant to remove facilities and rehabilitate the land upon field abandonment or expiration of a lease or oil and gas-related permit to the satisfaction of the land management authority (Lease Stipulation 58 [No Action Alternative]; Lease Stipulation G-1 [final Preferred Alternative and alternatives B and C]). Abandonment plans would be developed at the time of abandonment or expiration of the lease or permit, in consultation with appropriate local, state, and federal agencies, and would be subject to federal (BLM, USACE and/or USEPA) and state approval. The AO would take into consideration alternative uses for the infrastructure and the impacts of removing infrastructure and alternative means to rehabilitate the land. Federal agencies would undertake appropriate NEPA analysis of any such abandonment and rehabilitation decision at the time of abandonment or expiration of a lease or permit. All costs associated with abandonment, removal, and restoration are the responsibility of the lessee.

The AO may require any range of abandonment and rehabilitation steps for roads. For gravel roads, these steps could include: 1) leaving roads in place and maintained for continued use; 2) revegetating roads either naturally or actively by the permittee, removing bridges and culverts, and breaching roads to facilitate more natural water flow; or 3) removing roads, with gravel either being placed back into gravel pits or reused for other development in the area.

Abandonment of the proposed pipelines could include demolition and removal of the facilities and restoration of disturbed ground. It is anticipated that pipeline removal would be consistent with that described for TAPS in the TAPS Right of Way (ROW) Renewal EIS. Based on TAPS, it is assumed that abandonment could include the following:

- All aboveground pipelines, valves, and supporting structures would be removed to a depth that would prevent frost heave action lifting the remnant to the surface.
- Any below-ground pipeline segments would be cleared, cleaned of oil and other residues, capped, and left in place in locations where they would not interfere with other abandonment activities or planned land uses.
- Central production facilities would be used as work camps and staging areas to support pipeline abandonment activities.
- Residual, surplus, and scrap materials would be reused or recycled to the extent possible, and waste materials would be disposed of in accordance with applicable regulations.

It is assumed that aboveground facilities would be removed and wells plugged and capped. Equipment could be retrofitted for other North Slope use, or removed from the North Slope for subsequent reuse or scrap. Just as with roads, the ultimate fate of the gravel pad would not be known until closer to end of the production pad life. Permitting agencies could require that gravel be removed, in part or total, and the tundra revegetated. If other uses are determined by the permitting agencies to be preferable, the agencies could allow the permittee to leave the gravel pads in place, either revegetated or not revegetated. Removed gravel either would be disposed of or reused for another development.

Abandonment of airstrips could occur in conjunction with abandonment of pads. The gravel airstrips would be managed in a similar manner, depending on the decisions made by land managers and permitting agencies at the time of abandonment. Gravel airstrips would either be removed and the tundra revegetated, revegetated but otherwise left in place, or left in place and maintained for public use.

As with roads, abandonment of bridges and culverts would occur once the economic life of the oil fields had passed. Because the bridges and culverts are an integral portion of the proposed road network, the fate of the bridges would likely be determined by the fate of the road network. If bridges were removed, bridge superstructures would be taken apart and transported out of the area for recycling or disposal of the materials. Bridge piles likely would be cut off below the lowest anticipated scouring elevation from either natural scouring or a flood-induced event. The area of bridge abutments would be revegetated in a manner similar to that of the roadbed after gravel removal. If roads were left in place, but not with the intention that they be maintained for continued use, culverts could be removed and the gravel pads breached to facilitate water flow.

Abandonment activities would occur during winter months, when ice roads could be constructed to allow the removal of equipment. Overall, abandonment operations would take many years, as revegetation and environmental monitoring studies would continue to document the long-term effects of operations at a particular site. Monitoring abandonment would require periodic revisits to gather information on environmental parameters related to natural bedding and to document the success of abandonment actions. Normally, one helicopter with a crew of three would visit the sites annually for the first 5 years, followed by visits with increasing time gaps over the next 10 years. Site visits would include a maximum of 1 day per visit, and 1 visit per year. A series of permitting and inspection activities would be associated with any oil field abandonment, and would involve visiting the site as needed until satisfactory revegetation occurred.

Technical and Natural Constraints to Reclamation

The North Slope presents special technical challenges to restoration and recovery. Extremely cold temperatures, meager precipitation (5 to 7 inches per year), and the short growing season lengthen recovery times substantially beyond those possible elsewhere in the United States. Natural recovery of disturbed sites to original soil and plant conditions has been estimated to require 600 to 800 years for upland sites and 100 to 200 years for marsh sites (AOGA 2001).

Recovery of disturbed sites on the North Slope is complicated by the fact that any disturbance of the insulating vegetative mat can melt the underlying permafrost, a process that is extremely difficult to reverse and that can continue long after the initial disturbance ends. Finally, gravel pads and roads, which account for the vast majority

of the directly affected habitat on the North Slope, retain moisture and nutrients poorly and thus slow recovery processes.

Recovery times in the Arctic, as elsewhere, depend in part on the nature and extent of disturbance and the type of habitat affected. For example, wet sites tend to recover quickly from light oil spills; dry sites affected by diesel fuel spills recover exceedingly slowly, with little recovery occurring after several decades (Walker 1996). Disturbed areas that would recover relatively quickly in more temperate climates (such as those caused by Caterpillar tractor tracks), can persist for many decades because of melted permafrost.

Reclamation Research

During the past few decades, considerable industry research has examined the feasibility of rehabilitating areas disturbed by oil field activities (McKendrick 1997). Until recently, work focused on revegetating sites with exotic grasses to avert erosion. More recent efforts have focused on the use of native grasses and forbs and on the restoration of habitat processes and aesthetics, all of which are much more challenging goals (AOGA 2001).

A variety of rehabilitation strategies has been developed, including flooding of gravel mine sites to create overwintering habitat for fish; creation of wetlands in ponds perched on overburden stockpiles; revegetation of thick gravel fill and overburden to compensate for lost wildlife habitat; removal of gravel fill to help restore wet tundra habitats; restoration of tundra on less severely modified habitat; and remediation of areas contaminated by oil spills, seawater spills, and drilling mud (Jorgenson and Joyce 1994). The oil industry is conducting experiments at several sites throughout the Prudhoe Bay oil field and at old well sites in the National Petroleum Reserve – Alaska. Preliminary results indicate that, if cost is not a factor, a productive and diverse vegetative cover can be established even on sites with severe ecological limitations. Most of the studies suggest that natural recolonization occurs relatively rapidly on thin fill and on organic rich fill where moisture and nutrients are not severely limiting (Jorgenson 1997). Low temperatures near the coast, however, reduce the number of species available and the rate at which recolonization occurs. A survey of 12 revegetated pads in the National Petroleum Reserve – Alaska showed that, on average, only 3 native species were found on pads at the cold coastal sites, 10 were found on inland coastal plain pads, and 24 were found on relatively warm foothills sites (McKendrick 1987). Fertilization and seeding with normative species appears to delay natural recolonization (Jorgenson 1997).

More costly methods are required for rehabilitating the gravel roads, pads, and mine sites that dominate disturbed land. Construction of berms and basins, application of topsoil, and use of various plant cultivation techniques are required on these sites. However, only a very limited amount of topsoil has been stockpiled for future use in the oilfields (Jorgenson 1997). Sewage sludge is being considered as an alternative source of organic material. Native legumes with nitrogen-fixing ability could be essential for sustaining the long-term productivity of those sites.

Removal of gravel fill has recently been done in wetlands, and preliminary studies suggest that wetland mosaics of vegetation can be restored, although the method is expensive and finding acceptable locations for the fill can be difficult.

Open-pit gravel mine rehabilitation typically involves converting mine sites to lakes, with a channel usually cut between the pit and a stream or river so the site can be accessible to fish. Such sites create potential overwintering habitat for fish, but they also result in the permanent loss of the original habitats.

4.7.4.5 Global Climate Change

Based on current scientific research, there is growing concern about the potential effects of primary greenhouse gases (CO_2, methane, NO_x, ozone, water vapor, and chlorofluorocarbons) on global climate. Through many complex interactions on a regional and global scale, the lower layers of the atmosphere experience a net warming effect. These trends could be caused by greenhouse warming or natural fluctuations in the climate. There is an ongoing scientific debate about the cause of these trends.

The assessment of the impacts of climate change is in its formative phase, and it is not yet possible to know with confidence the net impact of such change. The potential effects of global climate change could alter water supply, food security, sea-level fluctuations, increasing levels of ultraviolet radiation, and natural variances in the ecosystem (ACIA 2004). Global climate change may affect surface resources in the Planning Area. Arctic average temperature has increased at almost twice the rate as the rest of the world.

Possible impacts of global climate change include negative effects on the ecology of the Arctic tundra, sea ice, and changes in the permafrost depth. Reduction in sea ice as a result of global climate change would affect marine mammals (particularly polar bears), fish, and birds, with related implications for Native subsistence harvests. A reduction in sea ice would likely increase marine transport and allow increased offshore extraction of oil and gas. Species ranges are predicted to move northward. Due to loss of habitat, or from competition from other species whose ranges shift northward, some Arctic species may be pushed toward extinction. Treeline is expected to move northward, with forests replacing tundra and tundra vegetation moving into unvegetated areas. Early thawing of rivers may impact caribou migrations to calving grounds. In addition, potential sea level rise, increases in severe weather, and thawing of tundra could have negative effects on oil and gas-related infrastructure. Elevated ultraviolet radiation levels could lead to higher levels of skin cancer, cataracts, and immune system disorders in Alaska Natives. However, some Arctic fisheries are expected to become more productive.

Because climate change must be viewed from a global perspective, the magnitude of the emissions potentially contributed by oil and gas activities in the Planning Area needs to be viewed in that context. Activities associated with exploration, development, and production of oil and gas resources from the Planning Area would produce some of the listed greenhouse gases, primarily as a result of power requirements and fuel consumption, activities that produce CO. The incremental contribution of greenhouse gases from the proposed alternatives in the Planning Area would be minor when compared to total greenhouse gas contributions. Despite the fact that a relatively small percentage of the world's greenhouse gas emissions originate in the Arctic, the changes in climate in the Arctic are among the largest on earth.

The winter drilling season on the North Slope has been shortened by half because warmer temperatures result in later freezing of the tundra and earlier thaws in the spring. Although the 2003-2004 winter drilling season had the earliest opening in several years, no conclusions can be drawn as to whether it is the beginning of a trend. Based on the last 30 years, the overall trend is that the drilling season is getting shorter, in spite of an occasional earlier opening or later spring thaw. If this trend continues, the continued shortening of the drilling season would have serious impacts on the way in which oil and gas activities are conducted, with the greatest impact on exploration activities. It is possible that technological advances in transportation and drilling equipment would mitigate the effects of shorter seasons and result in an entirely new approach to drilling in the Arctic that would have much less impact on the environment. It is not possible at this time to estimate the long-term effects of the shortened seasons on the discovery of hydrocarbon resources, but if trends continue, shorter drilling seasons could have the effect of reducing the recovery of the available resource.

4.7.5 Resource Protection Measures Considered in the Cumulative Effects Analysis

The cumulative impacts assessment assumes that ROPs and lease stipulations developed for the alternatives (see Appendix E and Section 2.6.1) would be adopted to protect environmental and social resources in the Planning Area. The effectiveness of these protections has been identified under each resource area for each alternative in sections 4.3 through 4.6, and in Table 2-2.

In addition, a number of federal, state, NSB, and Alaska Native resource management and monitoring programs have been established to protect environmental resources and, in cases where there is existing environmental impairment, to effect restoration. The assessment of cumulative impacts must recognize the existence of these programs and assume that the mandate under which each program was established will continue. The practical effect of these programs is that they are assumed to require avoidance or mitigation of the environmental impacts

that they are designed to address. The programs assumed to continue for the cumulative impact assessment are described by the resource that they manage or protect in the following sections:

4.7.5.1 Air Quality

Air quality is regulated under the PSD permitting process. For sources located in the OCS, the PSD program is administered by the USEPA. For sources located in state waters and onshore, the PSD program is administered by the ADEC. Although minor sources of air pollutants are not subject to PSD permitting requirements, the analysis of cumulative effects to air quality in this amendment considers the contribution of both major and minor sources of air pollution on the North Slope.

4.7.5.2 Water Quality

Water quality on the North Slope is regulated and/or monitored through various permitting and regulatory programs administered by the USEPA, ADNR, ADEC, ADFG, and NSB. These programs have been established to protect against the significant degradation of water quality associated with specific human and development activities. In evaluating the cumulative effects to water quality, collective impacts associated with regulated and non-regulated activities and naturally occurring events are considered.

4.7.5.3 Wetlands and Floodplains

Wetland impacts are mitigated through lease stipulations, ROPs, permits, and approvals issued at the exploration and development stages, and under Section 404 of the Clean Water Act, administered by the USACE. The objective of mitigation for unavoidable impacts is to offset environmental losses. Under a Memorandum of Agreement between the USEPA and USACE, it is recognized that in areas such as the North Slope of Alaska, avoidance or compensatory mitigation may not be practical due to the high proportion of land that is wetlands. The USEPA and USACE are working with industry to develop alternate methods to satisfy necessary compensation requirements for loss of wetlands on the North Slope.

4.7.5.4 Essential Fish Habitat

The amended Magnuson-Stevens Act requires federal agencies that authorize, fund, or conduct activities that may harm Essential Fish Habitat to work with NOAA Fisheries Service to develop measures that minimize damage to EFH. By providing EFH conservation recommendations before an activity begins, NOAA Fisheries Service may help prevent habitat damage before it occurs, rather than restoring habitat after the fact, which is less efficient, unpredictable, and often more costly.

4.7.5.5 Caribou

The ADFG monitors caribou by a census of caribou calving and caribou distribution. These monitoring efforts provide a means of determining whether cumulative effects on caribou have occurred, or are occurring, on the North Slope, and help in developing measures to minimize effects.

4.7.5.6 Marine Mammals

The management of seals by NOAA Fisheries Service and polar bears by the USFWS under the Marine Mammal Protection Act of 1972 provides for protecting these species' populations and mitigating the potential effects of development on these species. For example, the USFWS implements measures to protect polar bear den sites through a Letter of Authorization under the Marine Mammal Protection Act.

4.7.5.7 Threatened and Endangered Species

The ESA of 1973 and the Amended IAP/EIS scoping process are appropriate vehicles to identify species that are potentially at risk from the incremental cumulative effects of activities that may occur under this amendment. Effects on listed species identified in the Planning Area by NOAA Fisheries Service and the USFWS under Section 7 of the ESA are covered by this cumulative analysis. The potential effects on each of the other species identified through scoping have also been reviewed and included, as appropriate.

Cumulative effects are analyzed for those species listed as endangered or threatened, or that are proposed or candidate for listing on the North Slope, in the Beaufort Sea, and in the Chukchi Sea, and that NOAA Fisheries Service and the USFWS indicated that this amendment should assess.

4.7.5.8 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* and an accompanying Presidential memorandum require each federal agency to make the consideration of environmental justice part of its mission. The existing demographics (race and income) and subsistence consumption of fish and game are discussed, disproportionate environmental and health effects on Alaska Natives are evaluated, and mitigating measures and their effects are presented.

4.7.5.9 Consultation and Coordination with Indian Tribal Governments

Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments,* requires consultation with Native tribal governments on "actions that have substantial direct effects on one or more Indian tribes." Representatives of the BLM have met with local tribal governments to discuss subsistence issues relating to the Amended IAP/EIS (see Chapter 5, Consultation and Coordination), and have established a dialogue on environmental justice with these communities. Mitigation measures included in this amendment evolved through negotiations between local, state, and federal agency representatives. Iñupiat traditional knowledge also had a part in developing mitigation. Conflict avoidance agreements between the oil industry and Iñupiat subsistence hunters are an important mechanism for overcoming conflicts.

4.7.6 Other Information Considered in Cumulative Effects Analysis

The assessment of cumulative impacts from oil and gas activities also considered the following information:

- More rigorous environmental standards and more environmentally prudent industry practices exist than ever before, including smaller facility footprints, fewer roads, directional drilling, elimination of most surface discharges into the water, practices that avoid damage to the tundra, and better working relations with the local residents.
- Current industry practices and the environmental state of the North Slope/Beaufort Sea region are continually observed and assessed, and much of this information is available to the public. This information, along with the ongoing dialogue between all levels of government and the interested public about environmental issues should continue to increase environmental awareness and encourage environmentally sound practices that, in turn, help reduce the potential for environmental damage.
- A key element in the development of North Slope/Beaufort Sea oil is the means of transporting the oil to outside markets—TAPS. The TAPS pipeline is 800 miles long, stretching from Pump Station 1 at Prudhoe Bay to the Valdez Marine Terminal. Assuming a corridor width of about 100 feet, it represents an area of about 16 square miles. This pipeline is expected to continue to serve as infrastructure for all oil production in the foreseeable future, eliminating the need for the construction of new oil pipelines other than feeder pipelines.

- Following the Exxon Valdez oil spill, substantive improvements have been made in tanker safety to reduce the potential for oil spills from tanker accidents, such as a mandatory phase-in of double-hulled tankers, better navigational systems, and tanker escorts. In addition, oil spill response capabilities for tanker-related oil spills have been increased substantially through the addition of equipment, personnel, training, and exercises. These initiatives were developed specifically to reduce the potential for future tanker accidents and to lessen their effects, should spills occur.
- If a major oil spill were to occur, there likely would be a slowdown in new development during which additional safeguards would be put in place and new ideas of pipeline placement and design would be researched. With these safeguards in place, the likelihood of an additional oil spill occurring from the same causative factors and impacting the same resources would be reduced. This emphasis on preventing a similar incident would further ensure the full recovery of those resources from the initial spill.
- Actual activities and the size and location of future oil and gas developments on the North Slope and in the Beaufort Sea are uncertain; this amendment presents a best estimate of what those activities and effects would be. It is unlikely that actual activities and effects would exactly match the scenarios developed for this amendment. Past efforts to foresee future activities have over predicted those activities in the projected scenario. Effective corrective measures have come out of ongoing monitoring by industry, government, and environmental groups. Subsequent discoveries and developments and other changes not accounted for in this scenario may need to be reassessed, as appropriate and as required by NEPA.

4.7.7 Analysis of Cumulative Effects By Resources

4.7.7.1 Air Quality

Cumulative air quality impacts may result from the emissions of hydrocarbons and byproducts of combustion. These impacts are primarily associated with onshore and offshore industrial activity on the North Slope, and to a lesser extent with road and pad construction and use, exploration activities, and abandonment and reclamation. Air quality impacts would also result if a spill occurs and the decision is made to burn the oil to lessen the impacts of the spill. Indirect impacts from air emissions include impacts to human health and global climate change. Technology has played an important role in reducing air emissions from oil and gas facilities, and will continue to do so in the future. These impacts may be regionally additive (e.g., increased concentrations of specific pollutants) or synergistic (e.g., chemical reactions that form ozone).

Past Effects and Their Accumulation

The types and relative amounts of air pollutants generated by oil and gas operations vary according to the phase of activity. During the exploration phase, emissions are produced by 1) diesel-power-generating equipment required for drilling exploratory and delineation wells; 2) trucks and other vehicles used in support of drilling activities; and 3) intermittent operations such as mud degassing and well testing. Pollutants generated primarily consist of NO_x (although both NO and NO_2 would be generated, ambient air standards are set only for NO_2), CO, and SO_2.

During the development phase, the primary emission sources are 1) piston-driven engines or turbines used to provide power for drilling, 2) heavy construction equipment used to install modules and pipelines, and 3) various vehicles and aircraft. The principal development-phase emissions consist of NO_2 with lesser amounts of SO_2, CO, and PM.

During the production phase, the primary source of emissions are power generation for heating, oil pumping, and water injection. The emissions consist primarily of NO_2, with smaller amounts of CO and PM. Another source of air pollutants is evaporative losses of VOCs from oil/water separators, pump and compressor seals, valves, and storage tanks. Venting and flaring also contribute to VOC and SO_2 emissions.

Ambient air quality on the North Slope of Alaska is relatively pristine, even though oil and gas exploration, development, and production have been under way for more than 30 years. Air monitoring at sites in the Kuparuk

and Prudhoe Bay fields has indicated that concentrations of NO_2, SO_2, and PM_{10} are well within state and federal air quality standards. British Petroleum's air quality modeling for the Liberty Project found that emissions from the Prudhoe Bay and Kuparuk fields have very little effect on ambient concentrations elsewhere.

There is concern that air pollutants (trace and major metals) may be harmful to Arctic vegetation, even at low concentrations, but there are few studies of air pollutant impacts on tundra vegetation. Kohut et al. (1994) measured air pollutant concentrations and their effects on vegetation adjacent to the CPF, where gas powered turbine pumps compress natural gas prior to injection, in the Prudhoe Bay oil field. The CPF is the largest source of NO_x in the Prudhoe Bay oil field, producing NO_x, NO_2, and NO, as well as O_3 and SO_2. Emissions from the CPF did not have effects on the local vegetation. Results did show an increase in foliar nitrogen near the CPF, but no visible injury to plants was found. Primary productivity in Arctic tundra, however, is often limited by nutrient supply, particularly nitrogen and phosphorus (McKendrick and Mitchell 1978; Chapin et al. 1980; Chapin and Shaver 1985). Fertilization leads to higher productivity and changes in the structure of Arctic plant communities (Chapin and Shaver 1985, McKendrick 1997) and may alter carbon balance at the ecosystem level (Billings et al. 1984). These impacts are likely to be confined to the immediate area of the pollutant source, but would accumulate (USDOI USFWS 1995a, NRC 2003). The use of more efficient air emission control technologies, reinjection of gas instead of flaring, and greater reliance on ice roads instead of gravel roads that produce dust, have helped to reduce the amount of pollutants generated on the North Slope.

Arctic haze is a phenomenon resulting from elevated concentrations of fine particulate matter found over the Arctic, primarily in winter and spring. Scientists believe that most of the pollutants contributing to Arctic haze are from combustion sources in Europe and Asia, as the Arctic haze phenomenon was first observed in the 1950s, long before oil development started on the North Slope.

Summary of Past Impacts and Their Accumulation

Ambient air quality on the North Slope of Alaska is relatively pristine, even though oil and gas exploration, development, and production have been under way for more than 30 years. Trace amounts of air pollutants, including metals, are accumulating in the vegetation at very low levels. Arctic haze is a phenomenon resulting from elevated concentrations of fine particulate matter found over the Arctic, and persists today. However, industrial activities in Europe and Asia appear to be the source of pollutants that contribute to Arctic haze.

Future Effects and Their Accumulation

Emissions on the North Slope are expected to decrease as the result of an overall downward trend in oil production; therefore, any possible contribution from local sources to air quality and Arctic haze would be reduced. Greater reliance on technologies that reduce the need for permanent roads and pads, and reduce the size of the facility footprint, would also result in lower levels of PM emissions.

Potential impacts from future lease sales offshore and on land would be scattered over a rather large area. Emissions associated with routine program activities could cause small increases in concentrations of some air pollutants, although it is not expected that there would be any exceedance of national or state air quality standards.

Maximum concentrations of air quality pollutants occur within 330 to 660 feet of the facility boundary, and dissipates rapidly as distance from the facility increases. Thus, there would be very little cumulative interaction between developments addressed in this proposal and other oil-producing facilities.

Arctic haze has the potential to increase as Asian economies grow. Until air pollution concentrations in Asia and Europe begin to decline, Arctic haze is likely to persist or get worse.

Abandonment and rehabilitation activities could have impacts similar to those of construction since it is anticipated that similar vehicles and other emission sources would be used. Because abandonment would not occur at a single location for any substantial length of time, and only a small portion of infrastructure may be reclaimed, the impact of air emissions at any single location and on the North Slope would be minor and short term. Impacts would be

less than those associated with construction if gravel fill was left in place, because there would be less use of the heavy vehicles and machinery that emit air emissions. During and following abandonment, production facilities would no longer contribute to North Slope air emissions, resulting in a countervailing effect to abandonment effects. Particulate matter emissions would also be reduced at sites that are revegetated.

Global Climate Change

While it is difficult to estimate greenhouse gas emissions from past and future oil and gas production activities in northern Alaska, it is assumed that greenhouse gas emissions would continue to be proportional to the oil production rate at the current ratio. Based on an assessment for the ADR (2004b), it is projected that oil production would remain near current levels (0.985 MMbbl), or decline somewhat, during the next decade. Based on this assumption, the regional greenhouse gas emissions associated with future cumulative production would be approximately the same as current emission levels, and approximately ½ the emission levels in the late 1980s. Greenhouse gas emissions associated with production activities can be reduced by using more fuel-efficient power generating equipment and vehicles and by minimizing flaring. The cumulative future oil production in northern Alaska would produce a relatively small (approximately 1 percent) additive contribution to global greenhouse gas emissions. Global greenhouse gas emissions could be reduced by conserving energy, improving energy efficiency, and developing alternative energy sources. The need for continued development of domestic new oil and gas resources will continue to exist, regardless of any downward pressure on the growth of future oil consumption as a result of measures to reduce greenhouse gas emissions. If Alaskan energy sources were not developed in the future, resources would have to be produced in other areas of the globe. The impacts on greenhouse gas emissions on the planet would be very similar, regardless of the location of the energy source.

Contribution of Amendment Alternatives to Cumulative Effects

Emissions from development resulting from the final Preferred Alternative and other alternatives would be small compared to the emissions from Prudhoe Bay and Kuparuk oil field production; projected emissions from the alternatives would account for only a small percentage of current and projected emissions.

The ADR (2004b) estimate of future oil production from the North Slope (0.84 to 0.99 MMbbl annually for the next 10 years) is similar to the current levels of production. Assuming that air pollutants generated are proportional to oil production levels, the Planning Area would contribute approximately 6 (Alternative A) to 16 (Alternative C) percent of the projected total output of air emissions on the North Slope, assuming an oil price of $25 per bbl; the final Preferred Alternative and Alternative B would be intermediate to these levels.

Conclusion

In the coming years, for the North Slope area as a whole, air quality should improve in those areas where oil production currently is the greatest, and should decline in areas where future development is expected to take place. It is likely that new development would be relatively scattered, keeping regional impacts small, except for higher, localized concentrations in the immediate vicinity of production facilities.

The cumulative effects of all projects affecting the North Slope of Alaska in the past have caused generally little deterioration in air quality, which remains better than that required by national standards. The amount of air pollutants generated should remain near current levels, and approximately 50 percent less than emission levels in the late 1980s. Improvements in air pollution control technology would help to reduce emissions from current levels, while air emissions could increase if more energy is required to maintain production in declining fields as waterflood or gas-lift injection are used to enhance oil recovery (NRC 2003). Clean Air Act standards would be used to establish the maximum concentrations of allowable pollutants for each operation proposed. As facilities are shut down, they would no longer contribute to North Slope air emissions. Particulate matter emissions would also be reduced at sites that are revegetated.

4.7.7.2 Paleontological Resources

Paleontological resources (plant and animal fossils) are nonrenewable. Once they are impacted or displaced from their natural context, the damage is irreparable and cumulative. While much of the Planning Area and North Slope is underlain by paleontological resources, most of these resources are of the marine plant and invertebrate variety and are so numerous that the potential impacts addressed in this amendment do not present a substantial threat. However, vertebrate fossils are much less common and are more likely to be impacted by the activities associated with non-oil and gas activities and oil and gas exploration and development on the North Slope.

While oil and gas exploration and development in the Planning Area are the primary contributing activities in terms of cumulative effects on paleontological resources on the North Slope, other contributing factors may also be important. These factors include permitted activities such as non-oil and gas development, overland moves, scientific data gathering, and recreation, and global climate change.

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Non-oil and gas activities, including camps associated with scientific studies, recreational use, overland moves by transport vehicles, and use of OHVs such as four-wheel vehicles and snowmachines, have likely impacted near-surface paleontological resources. Where Caterpillar or similar tractors have been used, or the vegetation has been bladed, vegetation scars persist to this day. An estimated 250 acres of tractor trail/tundra scars were created before 1973; about 50 acres remain evident today (NRC 2003).

Paleontological research and excavation, necessary for the recovery of scientific data, have contributed to the displacement of paleontological resources. Recreational activities and past exploration of the North Slope led to legal and illegal collecting and inadvertent damage, especially prior to the 1970s when there was less concern for protecting these resources. Most paleontological material is buried considerably deeper than archaeological material and is therefore not regularly encountered by chance. Some Pleistocene-age animal remains could be recovered in archaeological deposits if the deposit were old enough. In such situations, the remains would represent subsistence use of the animal(s) by humans. The faunal material would be considered part of both the archaeological record and the regional paleontological record. Construction of DEW-Line and other military sites, and village-related development on the North Slope, have also likely contributed to the loss of paleontological resources, either from removal or destruction. Approximately 2,500 acres have been impacted by these developments.

Oil and Gas Exploration and Development Activities

Ground-disturbing activities associated with oil and gas exploration and development have likely impacted paleontological resources. The older, land-based 2-D seismic technology consisted of long, intersecting seismic lines that used either dynamite or vibrators as the energy source. In the early stages of acquisition on the North Slope, much less care was taken to protect the tundra from damage during data acquisition. Damage, then as now, can result from inadequate snow cover and inappropriate equipment. Early roads were bladed in the tundra, and over 500 acres of roads were constructed by mounding peat (NRC 2003). Thus, near-surface paleontological material could have been lost. Use of ice roads and improvements in seismic gathering techniques (3-D and 4-D technologies) have resulted in fewer impacts to the ground surface, and potentially to paleontological resources, than occurred in the past.

The excavation of gravel to construct roads, pads, and other facilities since the late 1960s has added to the loss of paleontological resources. Most mammalian fossils are of Quaternary age, which also is the age and origin of most North Slope gravel sources. Therefore, the more gravel deposits that are excavated for development activities, the greater possibility that impacts to paleontological resources would occur. Through 2001, over 6,300 acres have been disturbed for gravel mines on the North Slope, with over 5,000 acres of disturbance occurring along rivers where paleontological resources are often exposed or close to the surface.

During the past several decades, greater reliance on technologies that reduce the need for gravel to construct permanent roads and pads and reduce the size of the facility footprint, and a slowing of oil development activities, have substantially reduced the amount of area disturbed annually to extract gravel resources. In addition, state and federal regulations that require surveys for and prohibit the removal of paleontological resources (including Lease Stipulation 74), have also slowed the cumulative loss of paleontological resources.

Summary of Past Impacts and Their Accumulation

Paleontological research and excavation, past non-oil and gas development, recreation, and oil and gas exploration and development have contributed to the loss of paleontological resources, either from removal or destruction. If paleontological resources removed in the past have been preserved in museum or private collections, their losses would not accumulate. If they have been lost forever, the impacts of this lost resource persist today. Approximately 2,500 acres have been disturbed or covered with gravel for non-oil and gas development. Approximately 1,750 acres have been disturbed from bladed and peat roads, exploration sites, and airstrips. Gravel mining has disturbed over 6,300 acres, much of this area along rivers where paleontological resources are often exposed or are close to the surface. Another 9,200 acres have been covered with gravel to create pads and roads. Paleontological resources found in these areas could be damaged, destroyed, or buried under gravel. Recent technological developments, including use of ice roads and pads, Rolligons, horizontal drilling, and roadless development have reduced the amount of surface disturbance associated with exploration and development activities, with likely benefits to near-surface paleontological resources.

Future Effects and Their Accumulation

An estimated 500 and 4,000 acres could be disturbed from non-oil and gas, and oil and gas, development in the Planning Area and on the North Slope during the next 25 years, respectively (Table 4-37). An additional 4,000 acres could be impacted by 2050 if development occurs in the Northwest and South National Petroleum – Reserve. The North Slope region is approximately 57 million acres, while the Arctic Coastal Plain, where most oil and gas development would take place, comprises 13 million of those acres. Surface disturbance associated with all past and reasonably foreseeable non-oil and gas, and oil and gas, development would impact approximately 0.05 percent of the Alaska North Slope and 0.2 percent of the ACP. Of this, gravel mining would account for about 500 acres in the next 25 years. These actions have the potential to add to the cumulative loss of paleontological resources. Site reclamation would not reduce this loss, as paleontological resources would have already been lost during site disturbance and development.

New innovations in technology that reduce the amount of surface disturbance associated with oil and gas activities, enforcement of regulations that require the assessment and protection of paleontological resources before ground-disturbing activities can occur, and a slowing of oil and gas development on the North Slope, would contribute the future protection of paleontological resources and slow their cumulative loss. Assessments to identify and protect paleontological resources in gravel mine areas should minimize or avoid the loss of these resources.

Paleontological resources are not ubiquitous across the North Slope, and it is possible that they would not be impacted in the future. Since paleontological material is deeply buried, the location of plant and animal fossils is predictable only to a limited degree, and most fossil localities remain unknown, making assessment of cumulative impacts difficult. However, as new exploration and development occurs on the North Slope, more of the North Slope would be subjected to ground disturbance and there would be additional opportunities for paleontological resources to be impacted. If impacts were to occur, it is probable that impacts would be greatest in areas of high oil and gas potential.

Perhaps a better approach to this analysis is to examine the resource from the standpoint of vulnerability. In many settings, paleontological resources are well protected by nature, in that they are so deeply buried and completely encased in sediments or rock that virtually nothing can impact them aside from excavation. In other instances, they are located on or near the ground surface and are very susceptible to impacts. In most cases, surface or near-surface paleontological resources are more likely to be impacted as the result of exploration activities than by development, since most exploration-related operations occur in the low-light conditions of winter. Although snow

cover may offer some protection, it also disguises surface manifestations, making them difficult to recognize and avoid. It is advisable to conduct surveys of proposed activity areas and overland travel routes during the snow-free months preceding the initiation of winter exploration activities.

Effects of Natural Events

Most paleontological material is exposed as a result of natural erosion. Typically, erosion occurs as a result of the action of flowing water, but also can occur as a result of wind, seasonal freezing and thawing, ground subsidence due to the thawing of unstable permafrost, and the movement of soil down slopes as it thaws. Natural erosion, and its impact on paleontological resources, is difficult to assess because in most cases it is regarded as discovery rather than a negative impact to the resource. Some of the most important paleontological resources are associated with river bank cuts and drainages.

Effects of a Large Oil Spill

The effects of a large oil spill on a paleontological deposit would be directly related to the time of year and the setting of the resource. If the spill were to occur during the time of year when the ground is not frozen, then the potential level of impact would be substantially higher. In an unfrozen setting, surface or near-surface paleontological resources would be impacted primarily from contamination that would affect radiocarbon and biomolecular analysis of the fossil material. Contamination would occur as a result of the cleanup rather than the actual spill. Impacts from both the spill and spill cleanup would be considerably less when the ground was frozen, although warm oil could melt the snow and permafrost and damage underlying paleontological resources. In the case of deeply buried paleontological deposits, neither the spill nor the subsequent cleanup (regardless of the time of year) would impact the resource. To date, there have been no large spills on the North Slope. The likelihood of a spill increases with time, but the potential for a spill would decrease as better equipment is used and spill prevention procedures are implemented, and oil production declines on the North Slope.

Global Climate Change

If global climate continues to warm, ice cover in the Arctic Ocean would shrink and sea level would. These events could accelerate the loss of shoreline along the Beaufort and Chukchi seas, where the shoreline is already rapidly retreating (an average of 8 feet per year; Reimnitz et al. 1985). Loss of coastline could also lead to the loss of paleontological resources on the North Slope. Higher sea levels and warmer temperatures could lead to greater snowmelt in spring and higher river levels, causing the loss of paleontological materials found along river banks. Warmer temperatures would also lead to warming and loss of permafrost, a shortening of the off-road tundra season (NRC 2003), and an increase the potential for seismic and other oil and gas activities to disturb near-surface paleontological resources. These impacts would be cumulative to those that have occurred in the past from other natural and man-made causes.

Contribution of Amendment Alternatives to Cumulative Effects

Nearly all of the Planning Area has been explored using 2-D seismic methods, and much of the northern half has been explored using 3-D methods. It is projected that approximately 200,000 (No Action Alternative) to 250,000 (alternatives B and C and the final Preferred Alternative) acres would be disturbed from seismic activities in the Planning Area under the alternatives, assuming 250 miles of 2-D and 37,500 miles of 3-D seismic lines over a 20-year period. This compares to 32,000 miles of seismic survey lines from 1990 to 2001 (NRC 2003). As seismic surveys were completed in the Planning Area and the remainder of the North Slope, the level of seismic activity and potential for impacts to paleontological resources would decline.

An estimated 300 (No Action Alternative) to 1,400 (Alternative C) (920; final Preferred Alternative) acres could be disturbed from oil and gas development in the Planning Area during the next 25 years if oil prices average $25 per bbl. The amount of area disturbed by the alternatives would comprise 0.002 to 0.011 (0.007) percent of the ACP, 0.0005 to 0.0024 (0.0016) percent of the North Slope, and up to 0.003 percent of the Planning Area. Lease

stipulations and ROPs developed for the alternatives would minimize or prohibit exploration and development activities near major rivers, further reducing the likelihood of impacts to paleontological resources.

Conclusion

Ground-disturbing activities, including non-oil and gas development and oil and gas exploration and development, have impacted paleontological resources to some degree. However, because of their unpredictable location, isolated and rare occurrence, and varying depth of deposit, the level of past and future impacts is difficult to assess. If lease stipulations were to continue to apply to survey and inventory prior to exploration and development activities, the cumulative impact to paleontological resources would be expected to be minor in the Planning Area; similar state and federal regulations would help to protect these resources elsewhere on the North Slope. Paleontological resources are nonrenewable, and once displacement or contamination impacts them, their value may be greatly and irreversibly compromised. Cumulative impacts to paleontological resources across the North Slope and in the Planning Area in the future are expected to be minor, given the small amount of area impacted and implementation of measures to avoid river drainages and other areas with known or likely paleontological resources.

4.7.7.3 Soil Resources

Cumulative impacts to soils within the Planning Area would occur from exploration and development activities. The infrastructure for non-oil and gas and oil and gas development and transportation is the most important aspect of the cumulative analysis.

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Non-oil and gas activities, including archaeological and paleontological digs, camps associated with scientific studies, recreational use, overland moves by transport vehicles, and use of OHVs such as four-wheel vehicles and snowmachines, have likely caused soil loss and erosion on less than 100 acres in the Planning Area. In most cases, loss of soil and erosion would be temporary, lasting only a few years. Where Caterpillar or similar tractors have been used, or the vegetation has been bladed, scars in the soil persist to this day. An estimated 250 acres of tractor trail/tundra scars were created before 1973; about 50 acres remain evident today (NRC 2003).

DEW-Line sites and other military facilities, villages, public roads, airstrips, and other non-oil and gas infrastructure have been developed using gravel pads or on bare ground. Approximately 2,500 acres have been impacted (about 700 acres for DEW-Line sites and related development, and 1,800 acres for villages), and this loss of soil and soil productivity are likely to persist into the indefinite future.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration. Much of the ACP has been surveyed since 1940, and soil was disturbed to varying degrees depending upon the soil and vegetation type, vehicle type, operator vigilance, and amount of snow cover. Studies of seismic and camp-move trails created in the 1980s showed that only a small portion of seismic trails were still evident 8 years later, yet 5 percent of camp-move trails still showed moderate to high disturbance. The greatest damage occurred where the vegetative mat was destroyed and the underlying soil was exposed. This resulted from tracked vehicles or sleds on skids cutting into hummocks, or from Caterpillar operators making a tight turn and dropping the blade too deeply into the snow. As noted earlier, about 50 acres of tractor trail/tundra scars persist today.

Use of newer technologies, including use of vehicles that apply less pressure to the ground and restricting travel to periods when there is adequate snow and frost cover to protect vegetation, have reduced the level of impacts to vegetation and soil. In 2001, a study conducted the summer following seismic work, found little to no impacts to tundra under seismic lines on 30 percent of the plots studied (Jorgenson et al. 2003). Minor impacts were found on

66 percent and moderate impacts were found on 4 percent of the plots; no plots were highly impacted. Camp move trails in this study had little or no impacts on 18 percent, minor impacts on 54 percent, moderate impacts on 29 percent, and high impacts on none of the plots. Impacts to soil were minor in areas with good tundra cover. This study suggested that improvements in the equipment and procedures used for seismic surveys have reduced the amount of impact to tundra and soil.

Other sources of soil loss include exploration sites with gravel pads, disturbed areas around these pads, exploration airstrips, and gravel exploration roads. Based on *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope* (NRC 2003), in 2001, approximately 1,200 acres had been impacted by these sites in the past, and 740 acres of disturbance were still evident. Most of these sites were developed before 1977, thus their effects on the landscape have persisted for decades, and are likely to persist for several more.

Oil and Gas Infrastructure. Peat and gravel roads and pads, and gravel mines have caused the direct loss of soil, and also led to the indirect loss of soil from thermokarst and alteration of natural drainage patterns. Through 2001, over 500 acres of peat roads still showed evidence of disturbance, even though most of these roads were constructed over 30 years ago. Gravel has been used to construct over 9,200 acres of roads and pads, while gravel mines have impacted another 6,360 acres. Approximately 4,500 acres of gravel mines have been reclaimed, but only 70 acres of pads and roads. Thus, direct impacts to soil and soil productivity persist on over 12,000 acres (NRC 2003).

Construction of gravel pads, roads, and airstrips has altered the moisture regime of tundra near the structure by changing natural drainage patterns and areas where snow accumulates. Snowdrifts caused by gravel structures have increased the wintertime soil surface temperature and increased thaw depth in soils near the structures. These impacts have been exacerbated by dust deposition and by the formation of impoundments. These factors combine to warm the soil, deepen thaw, and cause thermokarst adjacent to roads and other gravel structures (NRC 2003).

In general, most changes in the plant community and soils around gravel structures would occur within 164 feet of the structure (Woodward-Clyde Consultants 1983). If all effects were to occur within this zone, approximately 2 acres of soil could be indirectly impacted due to hydrologic changes per 1 acre of development. If so, the condition of approximately 18,000 acres of soil may have been altered due to hydrologic changes on the North Slope.

Recent technologies, including roadless development, horizontal drilling, and closer spacing of wells on pads, and a slowing of oil field development, have greatly reduced the amount of surface disturbance needed to develop and produce oil. As a result, the annual amount of surface disturbance associated with gravel roads and pads has slowed substantially during the past 2 decades.

Spills. Overall, the effects of spills on soil have not accumulated on the North Slope because the spills have been small and cleanup and rehabilitation efforts have generally been successful (NRC 2003).

Summary of Past Effects and Their Accumulation

Based on the above analysis, approximately 2,500 acres of direct impacts to soil from non-oil and gas activities persist today. Oil and gas activities have caused approximately 12,000 acres of direct impacts to soil that persist today; another 18,000 acres of indirect impacts have also occurred, some of which persist today. Since most of these impacts are associated with ongoing non-oil and gas residential and commercial development, and oil and gas activities, these impacts to soil are additive to future impacts and would be likely to persist for several decades or more. However, the rate at which soil is disturbed by development has slowed substantially in recent years due to advances in technology and a slowing of oil field development on the North Slope.

Future Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

It is anticipated that villages will continue to grow in the future due to population growth and to provide services and infrastructure to support new oil and gas development on the North Slope. The amount of area that would be disturbed by new development is projected to increase by 2 percent annually.

Although not part of the development scenario for the Planning Area, it is reasonably foreseeable that the State of Alaska would build a new highway from the existing oil fields or the TAPS to the Planning Area. One proposal is to build a road from the Spine Road to Nuiqsut. Assuming a length of 18 miles (to connect the existing Spine Road to a proposed bridge at the Colville River) and assuming the same impacts for construction as for other gravel roads and pads, such a road would cover approximately 80 acres of soil for the road and 20 acres of soil would be lost from development of gravel mines. Another proposal is to build a road from TAPS to the Planning Area. This road could be 100 or more miles in length, and would directly impact 425 acres or more of soil and indirectly impact substantially more soil. An additional 80 acres of soil would be lost due to development of gravel mines.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration. The number of acres disturbed annually by seismic activities would be similar to the amount of acreage that has been disturbed annually by seismic surveys during the past decade on the North Slope. An average of 1,300 miles of seismic trails is added each year, affecting about 40 to 1,300 mi^2 each year (NRC 2003). This area does not include the area between the trails, nor the area where recovery would occur. Based on soil and vegetation recovery studies, impacts to soil should be minor and short term (NRC 2003). It is assumed that seismic train moves would originate from Kuparuk, Barrow, or Umiat. Much of the distance from the point of origination to area where surveys were conducted would be on ice roads, reducing some of the impacts from surveys.

Oil Development and Production. An estimated 4,000 acres could be disturbed from oil and gas development on the North Slope during the next 25 years (Table 4-34). An additional 4,000 acres could be impacted by 2050 if development occurs in the Northwest and South National Petroleum – Reserve. Assuming 2 acres of indirect impacts to soil for each acre of direct impact, 16,000 acres of indirect impacts to soil could result from new development on the North Slope. Offshore development associated with leases in the Beaufort Sea could impact small areas along the coast for staging and storage of materials, but is unlikely to impact large areas of soil.

These impacts are additive to the impacts to soil that have accumulated in the past and persist today, but in the context of the ACP and North Slope, these cumulative impacts would be small. The North Slope region is approximately 57 million acres, while the Arctic Coastal Plain, where most oil and gas development would take place, comprises 13 million of those acres. Direct and indirect soil disturbance associated with all reasonably foreseeable oil and gas development would impact approximately 0.06 percent of the Alaska North Slope and 0.25 percent of the ACP. Of this, gravel mining would account for about 500 acres in the next 25 years. These actions have the potential to add to the cumulative loss of soil resources.

Oil Spills. Oil spills could impact soils by altering vegetation and from soil disturbance associated with clean-up activities. The oil alone would decrease plant growth, but oil spills probably would leave the surface organic mat intact. Spill cleanup, however, would be more likely to damage soils. Cleanups are not always well controlled; heavy traffic and digging, which are common cleanup methods, result in damaged soils. Oil-spill cleanup would mitigate impacts on soils only if cleanup methods and operations were very carefully controlled and minimized surface disturbance. The area affected would be limited to the area immediately adjacent to and covered by the spill.

Abandonment. Removal of aboveground facilities, pipelines, bridges, and power poles would have a minor impact on soils and permafrost. Soils and permafrost would remain unaffected for as long as pads and roads were maintained. Once maintenance of the roads and pads ceased, thaw subsidence in ice-rich areas would result in

settling of the gravel structures into thermokarst troughs. Removal of the roads and pads would accelerate thaw subsidence, but would also accelerate the reclamation process.

The North Slope presents special technical challenges to restoration and recovery. Extremely cold temperatures, meager precipitation (5 to 7 inches per year), and the short growing season lengthen recovery times substantially beyond those possible elsewhere in the United States. Natural recovery of disturbed sites to original soil and plant conditions has been estimated to require 600 to 800 years for upland sites and 100 to 200 years for marsh sites (AOGA 2001).

Global Climate Change

Experimental studies have shown that a warming of the soil could lead to increased turnover of soil organic matter and redistribution of nitrogen from soils to vegetation (Nadelhoffer et al. 1992 *in* NRC 2003). If warming were accompanied by increased soil moisture, there could be a long-term loss of both carbon and nitrogen from the system, and potential losses of mineralized nitrogen from leaching. The depth of the active layer is likely to increase. If the climate continues to warm, the period in which there would be adequate snow and frost on the ground to support seismic and other exploration activities would decrease, and the potential for seismic activities to disturb the soil would increase. The potential for many shallow streams, ponds, and wetlands in the Arctic to dry out under a warming climate is increased by the loss of permafrost (ACIA 2004). In other areas, warming of the surface permafrost could increase the formation of ponds, wetlands, and drainage networks, especially in areas with heavy concentrations of ground ice. Such thawing could also lead to large increases in sediment being deposited in rivers, lakes, and coastal marine environments, potentially impacting aquatic organisms.

As the permafrost warms, its ability to support structures diminishes, which could affect development on the North Slope. Thicker gravel may be needed to support structures, and abandoned work pads and roads could become unusable as they are cut up by deep polygonal troughs over thawing ice wedges, or by other thermokarst degradation.

Contribution of Amendment Alternatives to Cumulative Effects

Seismic activities could disturb up to 250,000 acres of soil under the action alternatives. The number of acres disturbed annually would be similar to the amount of acreage that has been disturbed annually by seismic surveys during the past decade in the Planning Area. It is assumed that seismic train moves would originate from Kuparuk and traverse about 30 miles east of the Planning Area in each direction. However, much of this distance would be along an ice road that is built annually from Kuparuk to the Alpine oil field, limiting most impacts of the seismic train outside of the Planning Area to the minor impacts associated with ice roads. Nonetheless, impacts associated with seismic operations occurring in the Northeast National Petroleum Reserve – Alaska would be additive with impacts from seismic operations in other portions of the National Petroleum Reserve – Alaska and across the North Slope.

If oil prices average $25 per bbl, development in the Planning Area would directly impact 300, 1,120, 1,380, and 920 acres of soil for alternatives A through D, respectively, and indirectly impact 400 to 2,400 acres of soil (1,600 acres under the final Preferred Alternative). Impacts associated with the Planning Area would be additive to past, present, and reasonably foreseeable future soil impacts on the North Slope. If global climate change persists, the effects to soil from non-oil and gas development, and oil and gas exploration and development, on the North Slope could be much greater than predicted.

Conclusion

Impacts to soils would occur from activities associated with oil and gas development, which would include exploration activities and construction of gravel pads, roads, airstrips, pipelines, and staging areas, and the excavation of material sites. The duration of the impacts would range from short term (1 to 5 years) if the soil was disturbed, and to up to several decades if the soil was removed. Overall, the area impacted by oil and gas development relative to the amount of available habitat on the ACP would be relatively small (approximately 0.25

percent), even with development occurring in the Planning Area. Nonetheless, impacts associated with exploration and development activities in the Planning Area would be additive with impacts from activities in other portions of the National Petroleum Reserve – Alaska and across the North Slope.

New innovations in technology that reduce the amount of surface disturbance associated with oil and gas activities, enforcement of regulations that require the assessment and protection of soil resources before ground-disturbing activities can occur, and a slowing of oil and gas development on the North Slope, would contribute the future protection of soil resources and slow their cumulative loss. Some soil would be restored as sites are abandoned and reclaimed. However, due to the harsh Arctic climate, it could take several hundred years for soil productivity to reach pre-disturbance levels on abandoned pads and roads.

4.7.7.4 Water Resources

Minor cumulative effects to water resources have occurred from non-oil and gas activities on the North Slope. Cumulative effects to water resources from oil and gas exploration and development in the Planning Area and across the North Slope could result from: 1) potential disturbance of stream banks or lake shorelines from oil and gas operations and the possible subsequent melting of permafrost (thermokarst erosion); 2) temporary blockages of natural channels and floodways during construction of roads and pipelines that would result in the disruption of drainage patterns; 3) increased erosion and sedimentation in rivers and lakes; 4) the removal of water from lakes for ice roads and pads; 5) increased use of the tundra for both oil and gas and non-oil and gas activities; 6) an increased amount of seismic surveys; 7) spills; and 8) removal of gravel from riverine pools and lakes.

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Activities not related to oil and gas exploration have the potential to impact water resources. However, all of these activities have also been ongoing for many years with minimal impact to water resources.

Temporary tent camps are generally located on existing pads or on well-drained soils along river terraces or uplands, set back from the stream or lakeshore with minimal surface disturbance. Excavation and collection activities have likely disturbed water bodies in the past. In the National Petroleum Reserve – Alaska, these activities must now must follow the National Outdoor Leadership School's "*Leave No Trace, Alaskan Tundra*" program to minimize impacts to vegetation and to reduce wastewater, human waste, and solid waste disposal. Similar care has been shown outside of the Reserve. Thus, permitted recreational activities would have minor cumulative impacts on water resources. Winter occupation or travel by vehicles or aircraft have resulted in minor spills. Most of these were cleaned up and had minor, short-term impacts on water resources.

DEW-Line sites and other military facilities, villages, public roads, airstrips, and other non-oil and gas infrastructure have been developed using gravel pads or on bare ground. Approximately 2,500 acres have been impacted, and these activities have impacted water quality and altered natural drainage patterns. These effects on water resources are likely to persist into the indefinite future.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration. Much of the ACP has been surveyed since 1940, and seismic activities have disturbed the soil, vegetation, and water over much of the ACP. Studies of seismic and camp-move trails created in the 1980s showed that only a small portion of seismic trails were still evident 8 years later, yet 5 percent of camp-move trails still showed moderate to high disturbance. The greatest damage occurred where the vegetative mat was destroyed and the underlying soil was exposed. This resulted from tracked vehicles or sleds on skids cutting into hummocks, or from Caterpillar operators making a tight turn and dropping the blade too deeply into the snow. About 50 acres of disturbance remains evident today, and it is likely that this disturbance has impacted nearby water bodies. Use of newer technologies, including use of vehicles that apply less pressure to the ground and

restricting travel to periods when there is adequate snow and frost cover to protect soil and vegetation, have reduced the likelihood of soil erosion and impacts to water quality.

Other potential water quality impacts are associated with exploration sites with gravel pads, disturbed areas around these pads, exploration airstrips, and gravel exploration roads. Based on *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope* (NRC 2003), in 2001, approximately 1,200 acres had been impacted by these sites in the past, and 740 acres of disturbance were still evident. Most of these sites were developed before 1977, thus their effects on the landscape, including soil erosion and sedimentation into nearby water bodies, have persisted for decades, and are likely to persist for several more.

Oil and Gas Infrastructure. Peat and gravel roads and pads, and gravel mines have caused the direct loss of soil, and also led to the indirect loss of soil from thermokarst and alteration of natural drainage patterns. Through 2001, over 500 acres of peat roads still showed evidence of disturbance, even though most of these roads were constructed over 30 years ago. Gravel has been used to construct over 9,200 acres of roads and pads, while gravel mines have impacted another 6,360 acres. Approximately 4,500 acres of gravel mines have been reclaimed, but only 70 acres of pads and roads. Thus, direct impacts to water bodies from soil erosion and direct disturbance could persist on over 12,000 acres (NRC 2003).

Construction of gravel pads, roads, and airstrips has altered the moisture regime of tundra near the structure by changing natural drainage patterns and areas where snow accumulates. Snowdrifts caused by gravel structures have increased the wintertime soil surface temperature and increased thaw depth in soils near the structures. These impacts have been exacerbated by dust deposition and by the formation of impoundments. These factors combine to warm the soil, deepen thaw, and cause thermokarst adjacent to roads and other gravel structures that can impact water quality (NRC 2003).

Besides thermokarst and drainage alteration, erosion and sedimentation have been caused by construction activities or vehicular crossings, especially during periods of high stream flow or lake levels. Inadequate design or placement of structures, culverts, or bridges has altered natural sediment transport and deposition, creating scour holes or channel bars and impounding water. Improper placement or sizing of gravel fill has resulted in erosion from pads or roadbeds adjacent to streams or lakes. Long-term effects would be changes in channel morphology and in the composition of lake and stream bottom materials.

In general, most changes in the plant community, soil, and water quality around gravel structures would occur within 164 feet of the structure (Woodward-Clyde Consultants 1983). If all effects were to occur within this zone, approximately 2 acres of water bodies could be indirectly impacted due to hydrologic changes per 1 acre of development. If so, hydrologic change may have occurred on approximately 18,000 acres on the North Slope.

Recent technologies, including roadless development, horizontal drilling, and closer spacing of wells on pads, and a slowing of oil field development, have greatly reduced the amount of surface disturbance needed to develop and produce oil. As a result, the annual amount of surface disturbance associated with gravel roads and pads has slowed substantially during the past 2 decades.

Gravel Mines. Improper siting of gravel-removal pits has resulted in changes to the configuration of stream channels or lakes, stream-flow hydraulics or lake dynamics, erosion and sedimentation, and ice damming and aufeis formation. Gravel removal for permanent gravel roads and drill pads has resulted in over 6,300 acres of surface impacts, over 5,000 of these acres associated with rivers. However, over 4,200 of these river-associated acres have been reclaimed, reducing cumulative effects to water resources on the North Slope and, at some sites, providing fish habitat.

Water Withdrawals. Removal of water from lakes, especially from fish-bearing lakes, for ice roads and pads during the winter months may have a minor cumulative impact. Regulations limit the drawdown in fish-bearing lakes to 15 percent of the under-ice volume. This restriction does not apply to non-fish bearing lakes. The impacts to water levels in lakes likely did not accumulate, as natural recharge processes are sufficient to recharge the lakes

each year. However, the long-term effects of this activity on fish, and other aquatic organisms, are not well understood (NRC 2003).

Spills and Other Contaminants. Overall, the effects of spills on soil have not accumulated on the North Slope because the spills have been small and cleanup and rehabilitation efforts have generally been successful (NRC 2003).

In 1976, drilling fluids from a site near Teshekpuk Lake broke through a retaining berm and flowed into Teshekpuk Lake. Although the amount of damage to the environment was minimal, all future reserve pits were designed to contain the total estimated volume of drill cuttings and muds below the level of the original tundra surface.

In the Prudhoe Bay area, trace metal contamination has been raised as a concern (Woodward et al. 1988; Snyder-Conn et al. 1997). Based on very limited sampling, Snyder-Conn et al. (1997) suggested that elevated levels of nickel and mercury exist in the snowpack near the ARCO gas-handling facility and that elevated levels of mercury, antimony, cadmium, copper, and lead exist near the NSB solid-waste incinerator. The total mercury concentration for this single snow sample near the gas-handling facility was 8.4 ppt, a few-fold higher than the chronic marine water quality standard of 1.2 ppt, but far below the acute toxic standard of 2,400 ppt.

Drilling Waste Disposal. In recent years, drilling wastes, which previously were stored in environmentally undesirable surface pits, have been injected into subsurface aquifers for permanent disposal. Although much of the water in aquifers below the impermeable permafrost is too saline to meet standards for a legally protected drinking water, some is not.

The North Slope of Alaska is largely classified as wetlands underlain by permafrost, which separates the surface-water system-active layer, lakes, streams-from the relatively isolated and little understood groundwater system of sub-permafrost formations (Williams 1970, Sloan 1987). Although water appears plentiful on the surface, the North Slope has an arid climate, and if a significant supply of fresh water exists in deep aquifers, it could be a valuable resource. There is little known about the effect of drilling waste disposal on subsurface aquifers and its cumulative effect (NRC 2003).

Marine Waters. Offshore activity in the Beaufort Sea has been limited. Activities that affect the quality of marine waters and flow patterns have included construction of gravel islands and causeways and discharges of materials. Only a few small spills have occurred in marine waters to date, but mechanical recovery, the method allowed by current regulations, is not efficient and only removes a small fraction of the spilled oil, especially in broken ice. Concerns about contamination of marine waters center primarily on the potential effects on marine organisms (NRC 2003).

There have been three permitted types of discharges to the Beaufort Sea over the life of the oil fields. First, individual facilities have discharges permitted under USEPA NPDES program. Second, small or localized discharges have been permitted under the North Slope General NPDES Permit. Third, exploratory drilling discharges were permitted under the Arctic General (or Beaufort General) NPDES Permit under either coastal effluent guidelines or offshore effluent guidelines (Wilson 2001).

Permitted NPDES discharges include effluents from seawater-treatment plants, desalination plants, sanitary-waste-processing units, deck drainage sumps (from offshore production facilities, such as Northstar), temporary construction dewatering, and occasional tests of fire suppression with water. These discharges are permitted for a specific facility, and there are monitoring and reporting requirements. The largest discharges under this program are ocean water and peat detritus (Wilson 2001).

Exploratory drilling discharges are covered under the USEPA Beaufort Sea General Permit and include disposal of drill cuttings and fluids from well-drilling operations. Although muds and cutting cannot be discharged onshore, offshore guidelines still allow discharges of muds and cuttings.

Monitoring is frequently required as a condition of discharge permits to ensure that discharges do not exceed water quality standards, are not toxic to marine organisms, do not degrade water quality, and do not pose a threat to human health. Thus, impacts from discharges to marine water were likely minor and have not accumulated.

Past Clean-Up Efforts in the Planning Area. In 1976, a cleanup program was initiated, based out of Point Lonely and Barrow. During the summer of 1976, over 23,500 drums were retrieved and 750,000 pounds of debris collected. In 1977, another 26,500 drums and 485 tons of debris were collected. In 1978, over 2 million pounds of debris were collected, primarily from the Skill Cliff Air Force Tower site and the Navy's Topagoruk and East Topagoruk test well sites. In 1979, another 1.8 million tons of debris were collected at old Navy sites and other sites in the National Petroleum Reserve – Alaska. Removal of this material lessened the likelihood of hazardous materials further impacting local water bodies.

Rehabilitation of pads and other disturbed sites began in the late 1970s, with the focus on lowering the drill pads and obliterating their straight edges, filling reserve pits, and revegetating sites. Germination success varied depending upon growing conditions during the summer; wet and foggy summers usually resulted in poor germination. It is estimated that about 550 acres were disturbed during the 1975-1982 USGS exploration program, that revegetation was attempted on 440 acres, and that vegetation became well established on nearly 400 acres by 1982.

Summary of Past Effects and Their Accumulation

Based on the above analysis, approximately 2,500 acres of direct surface disturbance from non-oil and gas activities have impacted water bodies and drainage patterns. Oil and gas activities have caused approximately 12,000 acres of direct impacts to lands on the North Slope, much of which consist of water bodies, and indirect impacts may have occurred on another 18,000 acres. Since most of these impacts are associated with ongoing non-oil and gas residential and commercial development, and oil and gas activities, these impacts to water are additive to future impacts and would be likely to persist for several decades or more. Several spills have occurred on the North Slope, but their effects have been minor and have likely not accumulated. Effects of discharges from offshore facilities and subsurface injection of drilling wastes are largely unknown, but likely have had little cumulative effect on water quality on the North Slope. Large amounts of debris was left on the North Slope from exploration and military activities from 1940 to 1970 that impacted water quality, but clean-up efforts since the 1970s have removed much of this debris.

Future Effects and Their Accumulation

Increased use of material sites, use of lakes as a water source for ice roads, and dust created by additional traffic on existing roads would cause impacts to water resources in the future. Offshore oil and gas operations and the use of tankers to transport oil from the TAPS to west coast refineries could have a cumulative effect on marine and estuarine water resources.

An estimated 4,000 acres could be disturbed from oil and gas development on the North Slope during the next 25 years (Table 4-37). An additional 4,000 acres could be impacted by 2050 if development occurs in the Northwest and South National Petroleum – Reserve. Assuming 2 acres of indirect impacts to water bodies for each acre of direct impact, approximately 16,000 acres of indirect impacts to water bodies could result from development on the North Slope.

These impacts are additive to the impacts to water bodies that have accumulated in the past and persist today, but in the context of the ACP and North Slope, these cumulative impacts would be small. Surface disturbance associated with all past and reasonably foreseeable non-oil and gas, and oil and gas, development would impact approximately 0.06 percent of the Alaska North Slope and 0.25 percent of the ACP. Of this, gravel mining would account for about 500 acres in the next 25 years. These actions have the potential to add to the cumulative loss and degradation of water resources.

The long-term effect of thermokarst erosion on water resources would persist, and new thermokarst erosion would be associated with new disturbance, especially in areas where the wave action of the water would accelerate the removal of the protective soil and vegetative cover. Fine-grained sediments melting out of the ice-rich permafrost would result in increased sediment erosion and changes to stream channel and bed morphology. Thermokarst erosion would also result from the cumulative effect of seismic activity on the tundra during winter months. Approximately 1 percent of the total cumulative line miles of seismic traverses would experience some level of thermokarst erosion to the tundra. An estimated 1,300 miles of seismic lines would be traveled annually, resulting in approximately 13 acres of impacts to water bodies each year. These impacts would accumulate and be additive to past effects to water bodies on the North Slope.

Natural drainage patterns can be disrupted when activities or structures divert, impede, or block flow in stream channels, lake currents, or shallow-water tracks. Since roads pose the single greatest impacting factor (diversions, impoundments, and increased sediment runoff), limiting the length of the roads, or the repeated use of roads, would provide a substantial reduction in impacts to water resources. Although most roads would be built during the winter months as ice roads, long-term oil and gas development in the Planning Area and the North Slope would require permanent gravel roads. These roads would impact shallow-water tracks and smaller stream channels and drainages.

Besides thermokarst and drainage alteration, erosion and sedimentation would be caused by construction activities or vehicular crossings, especially during periods of high stream flow or lake levels. Given that over 95 percent of the primary proposed development area (Barrow Arch) is comprised of water bodies, numerous bridge and culvert crossings would be needed where roads and pads are constructed. If culverts were properly sized and engineered, impacts to water flow from ice-blocking and other obstructions should be minimized. The major rivers should not be affected because lease stipulations would require bridges rather than culverts at crossings.

Improper siting of gravel-removal pits can result in changes to the configuration of stream channels or lakes, stream-flow hydraulics or lake dynamics, erosion and sedimentation, and ice damming and aufeis formation. Those changes would in turn result in long-term changes in stream channel and lakeshore sand and gravel-bar formation. Because gravel resources within the Planning Area are inadequate, new material sites or expansion of existing material sites would be likely. While these sites would require permits from the ADFG, it is possible that impedance and diversion of floodwaters, increased erosion and sedimentation, and increased thermokarst erosion adjacent to the material sites could occur. As noted above, most recent gravel pits have been sited on the tundra, rather than in rivers to minimize the effects described above. Gravel removal for permanent gravel roads and drill pads, however, would still present a long-term cumulative impact to the Planning Area and to the North Slope in general.

Removal of water from lakes, especially from fish-bearing lakes, for ice roads and pads during the winter months would be a moderate cumulative impact to the Planning Area and the North Slope in general. State regulations that apply to the North Slope and current and proposed lease stipulations and ROPs for the Planning Area limit the drawdown in fish-bearing lakes to 15 percent of the under-ice volume. This restriction does not apply to non-fish bearing lakes. Oil and gas exploration and development would require substantial volumes of water from lakes. Because the promising oil resources of the Planning Area and the North Slope are located in specific zones, lakes along these primary exploration and development zones would be used extensively for water during the winter months. This extensive use could have a long-term cumulative impact on the Planning Area, although restrictions imposed by the lease stipulations and ROPs would be effective in reducing these impacts on the Planning Area.

A large oil spill from oil and gas development in the Beaufort Sea would degrade the marine environment through the release of petroleum hydrocarbons into the water column. The hydrocarbon concentration could exceed the 1.5-ppm acute toxicity criterion for about a day in an area of about 0.8 mi^2. The 0.015-ppm chronic toxicity criterion also could be exceeded for 10 or more days in an area of about 4.6 to 17.4 mi^2. Small spills could exceed the acute-toxic level for less than a day, and chronic criterion could be exceeded for less than a month in an area of less than 100 km^2 (39 mi^2). An oil spill within the tundra in a fish-bearing lake could have substantial impact on the future fish resources of the lake and future use of the lake by wildlife and local natives. Although such a spill is not

expected, and the history of oil spills in the North Slope suggests that such a spill is unlikely (NRC 2003), long-term use of the Planning Area for oil and gas development, especially near Teshekpuk Lake, could result in such a spill.

Tankering of oil resources derived from the Planning Area or other North Slope areas at the southern end of the TAPS could result in a large tanker spill, and the oil could contact nearshore areas in Prince William Sound or the Gulf of Alaska in a relatively non-weathered state. It is estimated that such a spill would affect up to 10 percent of the water quality within the affected area, but could be larger and be similar to the Exxon Valdez spill. Recovery could take months to years, depending on the nature and location of the spill and wave energy in the spill area.

The quality of freshwater within the Planning Area should not be affected by any of the major projects considered in the cumulative case, unless there was a large oil spill within or near a fish-bearing lake. The effects of construction activities should be short term and have the greatest impact in the immediate vicinity of the activity. Construction activities are not expected to introduce or add any chemical contaminants. Removal of water from lakes during the winter months should not affect water quality. Only a large oil spill within or near a fish-bearing lake would present a possible impact to long-term water quality.

Global Climate Change

Global climate change could lead to increased evaporation and, in turn, to increased precipitation (this is already occurring). Over the Arctic as a whole, annual total precipitation is projected to increase by roughly 20 percent by the end of this century, with most of the increase coming as rain.

However, while there is high confidence that temperatures will rise and total annual precipitation will increase, it is not known whether the increase in precipitation will keep up with the warming and rate of evaporation. If precipitation does not keep up with the rate of evaporation, land areas could dry out.

Another concern is the degree of permafrost thawing and subsequent drainage of water from the land. For example, summer thawing now results in a large amount of water on the surface. However, this moisture could be lost if the depth of the active layers increases. This could result in desertification in some areas as warming continues (ACIA 2004).

Contribution of Amendment Alternatives to Cumulative Effects

Direct impacts to water quality from surface disturbance activities on the Planning Area would occur on approximately 250 (No Action Alternative) to 1,500 (Alternative C) acres (assuming an oil price of 25 per bbl), and indirect impacts would occur on 400 to 2,400 acres. Thus, direct and indirect impacts to water quality would occur on less than 0.01 percent of the Planning Area.

Approximately 600,000 acres in the TLSA would be closed to leasing under Alternative A. Wetland habitat comprises approximately 95 percent of this area. Thus, protection to water bodies would be greatest under Alternative A. Approximately 213,000 acres in the TLSA are closed to leasing under Alternative B, while Teshekpuk Lake (211,000 acres) is deferred from leasing under the final Preferred Alternative. Based on amount of surface area protected, water bodies would be nearly equally protected under these two alternatives. However, approximately 20 percent more development is projected to occur under Alternative B than the final Preferred Alternative, increasing the likelihood of impacts to aquatic bodies from construction of roads and pads, gravel mining, and other development and production activities under Alternative B. Under Alternative C, the entire Planning Area would be open to leasing. The amount of area disturbed from oil and gas activities is projected to be highest for this alternative. Thus, Alternative C would provide less protection to water resources than the other alternatives. The lease stipulations and ROPs provided for each alternative should reduce impacts from oil and gas exploration and development and keep impacts to water resources to a minor to moderate level. Still, future impacts to water resources would occur and would accumulate with past impacts.

Conclusion

Assuming cumulative effects to water resources would occur in relation to the amount of surface disturbance across the North Slope, direct and indirect cumulative effects could occur on approximately 0.06 percent of the North Slope and 0.25 percent of the ACP. Of this, gravel mining would account for about 500 acres in the next 25 years. The majority of the impacts would result from oil and gas development activities, with construction of roads, permanent drill pads, and water use from lakes during the winter months being the major contributors. Impacts from activities other than those associated with oil and gas development (including any oil and gas-related roads) would be minor. Because of the abundance of water resources on the North Slope, the overall cumulative impact to water resources on the North Slope and in the Planning Area would probably be small in magnitude and most impacts would be local in nature. These local impacts could be substantial and long term because of the concentration of promising oil and gas plays in specific zones within the Planning Area. The implementation of the lease stipulations and ROPs required for protection of water resources under each alternative should reduce the cumulative effect to water resources from oil and gas, and non-oil and gas, activities in the Planning Area to an acceptable level. Impacts associated with the Planning Area would be additive to past, present, and reasonably foreseeable future impacts on the North Slope.

4.7.7.5 Vegetation

Vegetation is a renewable resource; impacts to vegetation do not necessarily accumulate and are often reversible. However, due to the harsh climate and short growing seasons on the North Slope, it may take plants decades to centuries to recover from a disturbance. Oil and gas exploration and development in the Planning Area are the primary contributing activities, in terms of cumulative effects, on vegetation on the North Slope. The greatest impacts occur where vegetation is removed or buried under gravel or other material that destroys the vegetation. In the long term, global climate change may have a greater and more persistent effect on vegetation on the North Slope than oil and gas activities. Other factors that contribute to the cumulative loss of vegetation include permitted activities such as non-oil and gas overland moves and development, scientific data gathering, and recreational use by the public. Additional vegetation may be lost by indirect effects associated with dust from gravel roads and pads, and from alteration of natural drainage flows resulting from development.

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Non-oil and gas activities, including archaeological and paleontological digs, camps associated with scientific studies, recreational use, overland moves by transport vehicles, and use of OHVs such as four-wheel vehicles and snowmachines, have likely caused the loss of less than 100 acres of vegetation in the Planning Area. In most cases, loss of vegetation would be temporary, lasting only a few years. Where Caterpillar or similar tractors have been used, or the vegetation has been bladed, vegetation scars persist to this day. An estimated 250 acres of tractor trail/tundra scars were created before 1973; about 50 acres remain evident today (NRC 2003).

DEW-Line sites and other military facilities, villages, public roads, airstrips, and other non-oil and gas infrastructure have been developed using gravel pads or on bare ground cleared of vegetation. Approximately 2,500 acres have been impacted, and this loss of vegetative cover is likely to persist into the indefinite future.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration. Much of the ACP has been surveyed since 1940, and vegetation was disturbed to varying degrees depending upon the soil and vegetation type, vehicle type, operator vigilance, and amount of snow cover.. Studies of seismic and camp-move trails created in the 1980s showed that only a small portion of seismic trails were still evident 8 years later, yet 5 percent of camp-move trails still showed moderate to high disturbance. The greatest damage occurred where the vegetative mat was destroyed and the underlying soil was exposed. This resulted from tracked vehicles or sleds on skids cutting into hummocks, or from Caterpillar

operators making a tight turn and dropping the blade too deeply into the snow. As noted earlier, about 50 acres of tractor trail/tundra scars persist today.

Use of newer technologies, including vehicles that apply less pressure to the ground and restricting travel to periods when there is adequate snow and frost cover to protect vegetation, has reduced the level of impacts to vegetation. In 2001, a study conducted the summer following seismic work, found little to no impacts to tundra under seismic lines on 30 percent of the plots studied (Jorgenson et al. 2003). Minor impacts were found on 66 percent and moderate impacts were found on 4 percent of the plots; no plots were highly impacted. Camp move trails in this study had little or no impacts on 18 percent, minor impacts on 54 percent, moderate impacts on 29 percent, and high impacts on none of the plots. This study suggests that improvements in the equipment and procedures used for seismic surveys has reduced the amount of impact to tundra, resulting in a higher percentage of tundra in categories of low or little to no impacts and few, if any, highly impacted sites. Longer-term studies are needed to determine if these impacts persist for more than a few years and accumulate.

Other sources of vegetative loss include exploration sites with gravel pads, disturbed areas around these pads, exploration airstrips, and peat and gravel exploration roads. Based on *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope* (NRC 2003), in 2001, approximately 1,700 acres had been impacted by these sites in the past, and 1,130 acres of disturbance were still evident. Most of these sites were developed before 1977, thus their effects on the vegetative landscape have persisted for decades, and are likely to persist for several more decades. Over 500 acres of peat roads still showed evidence of disturbance, even though most of these roads were constructed over 30 years ago.

Oil and Gas Infrastructure. Gravel roads and pads, and gravel mines have caused the direct loss of vegetation, and also led to the indirect loss of vegetation and soil from thermokarst and alteration of natural drainage patterns. Gravel has been used to construct over 9,200 acres of roads and pads, while gravel mines have impacted another 6,360 acres. Approximately 4,500 acres of gravel mines have been reclaimed, but only 70 acres of pads and roads. Thus, direct impacts to vegetation persist today on over 12,000 acres (NRC 2003).

Construction of gravel pads, roads, and airstrips has altered the moisture regime of tundra near the structure by changing natural drainage patterns and areas where snow accumulates. Snowdrifts caused by gravel structures have increased the wintertime soil surface temperature and increased thaw depth in soils near the structures. These impacts have been exacerbated by dust deposition and by the formation of impoundments. These factors combine to warm the soil, deepen thaw, and cause thermokarst adjacent to roads and other gravel structures (NRC 2003).

In general, most changes in the plant community and soil around gravel structures would occur within 164 feet of the structure (Woodward-Clyde Consultants 1983). If all effects were to occur within this zone, approximately 2 acres of vegetation could be indirectly impacted due to hydrologic changes per 1 acre of development. If so, the condition of approximately 18,000 acres of vegetation may have been altered due to hydrologic changes on the North Slope.

The passage of vehicle traffic over gravel pads and roads results in dust and gravel being sprayed over vegetation within about 30 feet of the pad or road, and a noticeable dust shadow out to 150 feet or more. Within 30 feet of gravel structures, the dust and gravel can smother vegetation. The effects of dust on vegetation include early snowmelt, reduced soil nutrient concentrations, lower moisture, an altered soil organic horizon, and higher bulk density and depth of thaw (Everett 1980; Walker and Everett 1987; Auerbach et al. 1997). These studies found that plant species richness was reduced near gravel structures, particularly in naturally acidic soils. A decrease in acidophilus mosses, some lichen species, and certain heath taxa altered species composition (Walker and Everett 1987). In areas that experience heavy dust fallout, native plant communities have been killed and replaced by early-successional colonizers and species more tolerant of the altered site conditions. The magnitude of these effects depends on the duration of dust exposure (i.e., traffic intensity) and the distance from the source. Traffic volume and speed are generally low on in-field roads, which have limited dust impacts to vegetation. Based on assumptions used in this amendment, approximately 30 acres of vegetation have been impacted by dust for each 100 acres of development, suggesting that 2,700 acres of vegetation have been indirectly affected by gravel roads

and pads on the North Slope. These impacts are likely to persist as long as vehicle travel occurs on the pads and roads.

The material used for gravel fill can also impact vegetation near gravel structures. Saline material used as fill increases the salinity of water draining off of or leaching through the structure. Increased salinity at a site could alter the species composition of the plant community in the immediate vicinity of the gravel structure, shifting the community toward one comprised of species that are more tolerant of saline conditions (McKendrick 2000).

Spills. Overall, the effects of spills on vegetation have not accumulated on the North Slope because the spills have been small and cleanup and rehabilitation efforts have generally been successful (NRC 2003).

Air Quality. The effects of air quality on vegetation near industrial facilities on the North Slope appear to be minimal (Kohut et al. 1994; NRC 2003), although few studies have been conducted. Air quality currently meets federal and state air quality standards. Based on the few studies that have been conducted, these standards appear to be sufficient to have protected vegetation on the North Slope, although impacts to lichens from SO_2 have been shown to occur at concentrations well below the 3-hour standard, and the protection these limits on emissions provide to lichen species have been questioned (NRC 2003).

Summary of Past Impacts and Their Accumulation

Based on the above analysis, approximately 2,500 acres of direct impacts, and 5,000 acres of indirect impacts to vegetation from non-oil and gas activities persist today. Oil and gas activities have caused approximately 12,000 acres of direct impacts, and 21,000 acres of indirect impacts to vegetation that persist today. Since most of these impacts are associated with non-oil and gas residential and commercial development, and oil and gas activities, these impacts to vegetation are additive to future impacts and would be likely to persist for several decades or more.

Future Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Non-oil and gas activities, including archaeological and paleontological digs, camps associated with scientific studies, recreational use and other activities, overland moves by transport vehicles, and use of OHVs such as four-wheel vehicles and snowmachines, would continue to cause the loss of minor amounts of vegetation. In most cases, loss of vegetation would be temporary, lasting only a few years. DEW-Line sites and other military facilities, villages, airstrips, and other non-oil and gas infrastructure are likely to persist into the indefinite future, and for villages, likely increase in size, causing the loss of additional vegetation. The amount of area that would be disturbed by new development is projected to increase by 2 percent annually.

Although not part of the development scenario for the Planning Area, it is possible that the State of Alaska would build a new highway from the existing oil fields or the TAPS to the Planning Area. One proposal is to build a road from the Spine Road to Nuiqsut. Assuming a length of 18 miles (to connect the existing Spine Road to a proposed bridge at the Colville River), and assuming the same impacts for construction as for other gravel roads and pads, such a road would cover approximately 80 acres of vegetation; an additional 20 acres of vegetation would be impacted for a gravel mine. Another proposal is to build a road from TAPS to the Planning Area. This road could be 100 or more miles in length, and would directly impact 425 acres or more of vegetation from road construction and another 80 acres of vegetation due to gravel mining; indirect impacts to vegetation would be substantially greater.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration. An average of about 1,300 miles of seismic trails is added each year on the North Slope. Based on projections developed for the Planning Area, this activity could impact up to 100 acres of vegetation annually that would still show moderate to high levels of disturbance a decade later. However, based on

recent studies of the use of newer seismic technologies, it is likely that impacts to vegetation that persist for a decade or more would be substantially less than this estimate (Jorgenson et al. 2003).

Other sources of vegetative loss include exploration sites with gravel pads, disturbed areas around these pads, exploration airstrips, and gravel exploration roads. These have been replaced in recent years by ice roads, airstrips, and drilling pads to reduce costs and environmental effects of gravel construction (Johnson and Collins 1980, Hazen 1997). As a result, only a small amount of vegetation is likely to be effected in the long term by exploration sites and facilities.

Oil and Gas Infrastructure. Development activities that could contribute to cumulative effects to vegetation on the North Slope include oil development in other areas, including the Northwest and South National Petroleum Reserve – Alaska; federal and state offshore oil development (through the construction of supporting onshore infrastructure); state onshore oil development; oil transportation; and road construction. All of these activities involve construction of infrastructure that would destroy vegetation within the immediate footprint of the project and indirectly affect vegetation through dust, flooding, changes in natural drainage patterns, snow drifting, increased water and air pollution, and oil and chemical spills that could cause changes in the plant species composition and community types.

Although the increase in the amount of area disturbed by oil and gas development has slowed dramatically in recent years, it is estimated that an additional 3,500 acres would be covered by gravel, and 500 acres impacted by gravel mines, in the next 25 years, much of this in the Planning Area. Approximately 9,200 acres would be indirectly affected by dust, changes in hydrology, and thermokarst. An additional 4,000 acres of vegetation could be impacted by oil and gas activities between 2030 and 2055; another 9,200 acres would be indirectly impacted by development.

These impacts are additive to the impacts to vegetation that have accumulated in the past and persist today, but in the context of the ACP and North Slope, these cumulative impacts would be small. Based on direct (21,000 acres) and indirect (36,000 acres) impacts that could still persist in 2050, direct and indirect impacts to vegetation from activities on the North Slope would impact approximately 0.43 percent of the ACP and 0.10 percent of the North Slope. These estimates do not take into account the quality of the vegetation that would be impacted on the North Slope. If rare plants or unusual or scarce plant communities are harmed or lost, impacts to vegetation could be greater based on qualitative factors.

Spills. Oil produced as a result of development in the Planning Area would contribute to less than 13 percent of future spills from TAPS, but would increase the number of onshore oil spills and would likely impact tundra systems in some instances.

Air Quality. Emissions on the North Slope are expected to decrease as the result of an overall downward trend in oil production. Greater reliance on technologies that reduce the need for permanent roads and pads, and reduce the size of the facility footprint, also would result in lower levels of particulate matter emissions. Still, impacts to vegetation from past and future air pollutants could accumulate.

Sensitive Plant Species. Development would be unlikely to have a high negative effect on plant species or communities. However, if facilities were constructed in an area containing a population of a rare plant species, the impacts to that species could be high. Three rare North Slope plant species are known to occur in the Planning Area, and four other rare species are known to occur on the North Slope but have not been documented, in the Planning Area. Sabine grass is an aquatic grass that rarely occurs between the pendent grass and sedge zones in lakes and ponds. This species is known in few locations north and northeast of Teshekpuk Lake. This area would be open to development under the final Preferred Alternative and alternative C, but not under alternatives A or B. Stipulated cinquefoil has been found at Umiat; this Asian species is found in sandy substrates, such as sandy meadows, and riverbank silts and sands other than dunes. This species would be protected by setbacks along rivers in the Planning Area and by the designation of the Colville River Special Area. Muir's fleabane, Drummond's bluebell, and Hartz's bluegrass all occur in dry habitats associated with bluffs, floodplains, river terraces, sand

dunes, and rock outcrops. These habitats are the primary sources of gravel fill used during construction and development (NRC 2003) and could be impacted by development in these areas. Because of the limited number of plants comprising these populations, loss of one or more plant populations could be a significant cumulative impact to the species.

Abandonment. The North Slope presents special technical challenges to restoration and recovery. Extremely cold temperatures, meager precipitation (5 to 7 inches per year), and the short growing season lengthen recovery times substantially beyond those possible elsewhere in the United States. Natural recovery of disturbed sites to original soil and plant conditions has been estimated to require 600 to 800 years for upland sites and 100 to 200 years for marsh sites (AOGA 2001).

Recovery of disturbed sites on the North Slope is complicated by the fact that any disturbance of the insulating vegetative mat can melt the underlying permafrost, a process that is extremely difficult to reverse and that can continue long after the initial disturbance ends. Finally, gravel pads and roads, which account for the vast majority of the directly affected habitat on the North Slope, retain moisture and nutrients poorly and thus slow recovery processes.

Recovery times in the Arctic, as elsewhere, depend in part on the nature and extent of disturbance and the type of habitat affected. For example, wet sites tend to recover quickly from light oil spills; dry sites affected by diesel fuel spills recover exceedingly slowly, with little recovery occurring after several decades (Walker 1996). Disturbed areas that would recover relatively quickly in more temperate climates (such as those caused by Caterpillar tractor tracks), can persist for many decades because of melted permafrost.

Reclamation of oil fields, even over a long period of time, would reduce some of the cumulative effects of vegetative loss.

Global Climate Change

Temperatures in Alaska, and throughout the Arctic, are thought to have fluctuated considerably over the last few centuries (Mann et al. 1999). Despite this fluctuation, the last 100 years appear to have been the warmest century in the last 400 years (Overpeck et al. 1997; IPCC 2001; ACIA 2004). As predicted by global climate models, Alaska's surface air temperature has warmed throughout much of the state since at least the mid-1970s (IPCC 2001, ACIA 2004). Continued warming of the climate could have major effects on the ecosystems of Alaska, particularly the North Slope. However, the large amount of natural variation inherent in the system limits our current understanding of the consequences of climate change.

Chapin et al. (1995) suggested that climate change might be altering the species composition of the Alaskan Arctic tundra. A warmer, wetter environment with a longer growing season could greatly affect the productivity and growth form composition of tundra by causing a more rapid release of nutrients from decomposing soil organic matter (Nadelhoffer et al. 1991). Similarly, changes in the water table, which alter decomposition and nutrient availability, substantially alter the carbon balance of tundra and taiga microcosms (Billings et al. 1983; Funk et al. 1994). These changes may eventually lead to shifts in the composition of Arctic tundra toward more shrub species at the expense of grass and sedge species. Warmer soil temperatures are likely to increase thermokarst, and increases in sea level may inundate low lying tundra areas, increasing aquatic and wet tundra vegetation types and erosion of coastal bluffs (ACIA 2004). Such impacts of climate change could accelerate or exacerbate changes in soil thermal regimes that occur with development, potentially leading to greater impacts to vegetation from changes associated with thermokarst.

Contribution of Amendment Alternatives to Cumulative Effects

Long-term impacts to vegetation from seismic surveys in the Planning Area would occur on approximately 150 (Alternative A) to 2000 (alternatives B, C, and D) acres. Impacts from ice road construction would occur on another 210 acres annually, while impacts from ice pads would occur on 30 to 270 acres during the life of the project; these impacts to vegetation would be short-term and would not accumulate.

If oil prices average $25 per bbl, development in the Planning Area could directly impact approximately 300, 1,120, 1,380, and 920 acres, and indirectly impact 450, 2,360, 2,730, and 1,890 acres of vegetation for Alternatives A through D, respectively. These impacts would be long-term and would accumulate. Total direct and indirect impacts to vegetation would occur on 0.02 (No Action Alternative) to 0.09 (Alternative C) percent of the Planning Area.

Conclusion

Impacts to vegetation on the North Slope from oil and gas exploration and development are expected to be additive with respect to impacts from other past, present, and future non-oil and gas and oil and gas activities. The impacts in the Planning Area would increase the total amount of vegetation impacted by all oil and gas development, but would not be expected to have synergistic effects that would affect additional acreage. The area impacted by oil and gas development, relative to the amount of available habitat on the ACP in Alaska and on the North Slope as a whole, is relatively small. The four alternatives differ in the acreage of vegetation that would be impacted. The No Action Alternative would contribute a smaller amount to cumulative vegetation loss across the North Slope than the action alternatives. The final Preferred Alternative would result in less vegetation loss than alternatives B and C.

4.7.7.6 Wetlands and Floodplains

In compliance with Executive Order 11990, Protection of Wetlands and Floodplains, the BLM has prepared an impact analysis on those areas within Planning Area that are considered to have the function and value of wetlands, as described in Section 3.3.2 (Wetlands and Floodplains). Approximately 95 percent of the ACP in the Planning Area consists of wetlands. Resources included in the summary discussion below are classified as having the function and value of wetlands and floodplains on the North Slope. The reader should read the soil (Section 4.7.7.3), water (Section 4.7.7.4), and vegetation (Section 4.7.7.5) resource sections for more detailed information on the cumulative effects to these resources.

Past Effects and Their Accumulation

Soil Resources

Based on the analysis for soil resources, and assuming approximately 95 percent of past disturbance areas were wetlands, approximately 2,400 acres of direct impacts to wetland soil from non-oil and gas activities persist today. Oil and gas activities have caused approximately 11,400 acres of direct impacts to wetland soil that persist today; another 17,100 acres of indirect impacts have also occurred, some of which persist today. Since most of these impacts are associated with ongoing non-oil and gas residential and commercial development, and oil and gas activities, these impacts to soil are additive to future impacts and would be likely to persist for several decades or more. However, the rate at which wetland soil is disturbed by development has slowed substantially in recent years due to advances in technology and a slowing of oil field development on the North Slope. In addition, greater effort has been placed on avoiding wetlands when siting permanent facilities.

Water Resources

Based on the above analysis, direct and indirect effects from non-oil and gas activities, especially those associated with activities at villages, and oil and gas activities have caused approximately 14,500 acres of direct impacts to lands on the North Slope, much of which consist of water bodies; indirectly impacted water bodies and flows on another 18,000 acres. Since most of these impacts are associated with ongoing non-oil and gas residential and commercial development, and oil and gas activities, these impacts to water are additive to future impacts and would be likely to persist for several decades or more. Several spills have occurred on the North Slope, but their effects have been minor and have likely not accumulated. Effects of discharges from offshore facilities and subsurface injection of drilling wastes are largely unknown, but likely have had little cumulative effect on water quality on the North Slope. Large amounts of debris was left on the North Slope from exploration and military

activities from 1940 to 1970 that impacted water quality, but clean-up efforts since the 1970s have removed much of this debris and reduced effects to water.

Vegetation

Based on the above analysis, approximately 2,400 acres of direct impacts, and 4,800 acres of indirect impacts to wetland vegetation from non-oil and gas activities persist today. Oil and gas activities have caused approximately 11,400 acres of direct impacts, and 20,000 acres of indirect impacts to wetland vegetation that persist today. Since most of these impacts are associated with non-oil and gas residential and commercial development, and oil and gas activities, these impacts to wetland vegetation are additive to future impacts and would be likely to persist for several decades or more.

Future Effects and Their Accumulation

Soil Resources

Oil and gas exploration and development and other activities on the North Slope have impacted, and will impact in the future, a very small fraction of the wetland soil on the North Slope. An average of about 1,300 miles of seismic trails is added each year on the North Slope. Based on projections developed for the Planning Area, this activity could impact up to 100 acres of wetland soil annually. However, based on recent studies of the use of newer seismic technologies, it is likely that impacts to wetland soil that persist for a decade or more would be substantially less than this estimate (Jorgenson et al. 2003).

Other sources of wetland soil loss include exploration sites with gravel pads, disturbed areas around these pads, exploration airstrips, and gravel exploration roads. These have been replaced in recent years by ice roads, airstrips, and drilling pads to reduce costs and environmental effects of gravel construction (Johnson and Collins 1980, Hazen 1997). As a result, only a small amount of wetland soil is likely to be effected in the long term by exploration sites and facilities.

Water Resources

Water use by North Slope villages and oil and gas activities will continue to draw from local surface water sources. Water is abundant on the North Slope, and impacts should be localized and minimal.

The amount of wetland area directly and indirectly impacted by oil and gas exploration and development activities in the Planning Area would be a very small portion of the ACP (0.04 percent). Direct and indirect impacts to surface water resources from past, present, and reasonably foreseeable future development would occur on approximately 0.4 percent of the ACP and 0.1 percent of the North Slope. Impacts associated with the Planning Area would be additive to past, present, and reasonably foreseeable future impacts on the North Slope, although it is expected that water resource characteristics and quality would improve once oil and gas exploration and/or development activities cease in an area.

Oil and gas activities may produce short-term local impacts to water quality. Oil spills can create short and long-term impacts to surface water. A crude oil spill from a tanker could cause short-term water quality impacts to saltwater along the tanker routes south of Valdez.

Vegetation

The northern portion of the North Slope in general has a greater proportion of wetlands and is thought to be the area with the greatest oil and gas potential. Impacts to wetlands on the North Slope from oil and gas exploration and development are expected to be additive with respect to impacts from other present and future oil and gas activities outside of the Planning Area. The impacts in the Planning Area and on the North Slope would increase the total amount of wetland vegetation impacted by oil and gas development. The area impacted by oil and gas development, relative to the amount of available habitat on the ACP in Alaska and on the North Slope as a whole,

is relatively small, even if development occurs in the Planning Area. It is estimated that direct and indirect impacts to wetland vegetation would occur on 0.4 percent of the ACP and 0.1 percent of the North Slope.

Impacts to floodplains could occur from river channel crossings by pipelines and roads, which could destroy vegetation where bridge pilings or VSMs were required for the crossing. Construction of a buried pipeline under the river channel would also have impacts to floodplain vegetation in portions of the floodplain where the pipeline was buried. These impacts would be additive with impacts from other developments occurring on the North Slope.

Much of the gravel used for the construction of roads, pads and airstrips on the North Slope has been obtained from deposits in river floodplains. Impacts from these activities include habitat modifications, caused by increased braiding and spreading of flows (Woodward-Clyde Consultants 1980, NRC 2003). Established guidelines have largely restricted gravel mining to deep mining in upland pits, which may be flooded upon abandonment to create aquatic habitat including fish overwintering areas (NRC 2003). Approximately 500 acres of wetland vegetation would be disturbed by the establishment of gravel extraction sites on the North Slope; this acreage could be higher if one or more roads were built to connect the Dalton Highway to the National Petroleum Reserve - Alaska. These impacts would be additive with other impacts to floodplains across the North Slope, but the extent of impact would depend on the availability of gravel from upland areas.

Abandonment

The North Slope presents special technical challenges to restoration and recovery. Extremely cold temperatures, meager precipitation (5 to 7 inches per year), and the short growing season lengthen recovery times substantially beyond those possible elsewhere in the United States. Natural recovery of disturbed sites to original soil and plant conditions has been estimated to require 600 to 800 years for upland sites and 100 to 200 years for wetland sites (AOGA 2001).

Recovery times in the Arctic, as elsewhere, depend in part on the nature and extent of disturbance and the type of habitat affected. For example, wet sites tend to recover quickly from light oil spills; dry sites affected by diesel fuel spills recover exceedingly slowly, with little recovery occurring after several decades (Walker 1996). Disturbed areas that would recover relatively quickly in more temperate climates (such as those caused by Caterpillar tractor tracks), can persist for many decades because of melted permafrost.

Removal of gravel fill has recently been done in wetlands, and preliminary studies suggest that wetland mosaics of vegetation can be restored, although the method is expensive and finding acceptable locations for the fill can be difficult. Open-pit gravel mine rehabilitation typically involves converting mine sites to wetlands, including lakes, with a channel usually cut between the pit and a stream or river so the site can be accessible to fish. Such sites create potential overwintering habitat for fish, but they also result in the permanent loss of the original habitats.

Global Climate Change

The potential for many shallow streams, ponds, and wetlands in the Arctic to dry out under a warming climate is increased by the loss of permafrost (ACIA 2004). In other areas, warming of the surface permafrost could increase the formation of ponds, wetlands, and drainage networks, especially in areas with heavy concentrations of ground ice. Such thawing could also lead to large increases in sediment being deposited in rivers, lakes, and coastal marine environments, potentially impacting aquatic organisms.

Global climate change could alter species composition, increasing the prevalence of deciduous shrubs and decreasing the prevalence of wetland sedges and grasses, and could greatly influence wetlands through hydrological changes. Chapin et al. (1995) suggested that climate change might be altering the species composition of the Alaskan Arctic tundra. Global climate changes may eventually lead to shifts in the composition of Arctic tundra toward more shrub species at the expense of grass and sedge species. Warmer soil temperatures are likely to increase thermokarst and increases in sea level may inundate low lying tundra areas increasing aquatic and wet tundra vegetation types and increase erosion of coastal bluffs (ACIA 2004). Such impacts of climate change could

accelerate or exacerbate changes in soil thermal regimes that occur with development potentially leading to greater impacts to vegetation from changes associated with thermokarst.

Contribution of Amendment Alternatives to Cumulative Effects

Seismic activities could disturb up to 238,000 acres of wetland soil, water, and vegetation under alternatives B, C, and D over a 25-year period, and 48,000 fewer acres would be disturbed under the No Action Alternative; these impacts would be short term. The number of acres disturbed annually would be similar to the acreage that has been disturbed annually by seismic surveys during the past decade on the North Slope. Based on vegetation recovery studies, these impacts to wetland soils should be minor and short term (NRC 2003). It is assumed that seismic train activities would originate from Kuparuk and traverse about 30 miles of lands east of the Planning Area in each direction. However, much of this distance would be along an ice road that is built annually from Kuparuk to the Alpine field, limiting most impacts of the seismic train outside of the Planning Area to the minor impacts associated with ice roads. Nonetheless, impacts associated with seismic operations occurring in the Northeast National Petroleum Reserve – Alaska would be additive with impacts from seismic operations in other portions of the National Petroleum Reserve – Alaska and across the North Slope.

All of the Northeast National Petroleum Reserve – Alaska would be open to oil and gas leasing under Alternative C. Land unavailable for leasing and surface activity under the No Action Alternative, Alternative B, and the final Preferred Alternative would prevent development in areas that are predominately wetlands. The Goose Molting Area, in particular, contains a large percentage of the wetland vegetation types preferred by waterfowl, including aquatic vegetation dominated by water sedge and pendent grass. Under Alternative C, these areas would be more likely to be developed, and these vegetation classes would likely be impacted to a greater extent, than under any of the other alternatives. Under Alternative C, actions would contribute to cumulative wetland loss on the North Slope to a greater extent. Alternative B would contribute more to wetland loss than would the final Preferred Alternative. Assuming that 95 percent of the disturbance area would be to wetlands, approximately 760, 3,300, 4,000, and 2,670 acres of wetland soil, water, and vegetation resources would be directly and indirectly impacted by alternatives A through D, respectively. Total direct and indirect impacts to wetlands would occur on 0.02 (No Action Alternative) to 0.09 (Alternative C) percent of the Planning Area, and would comprise from 0.001 to 0.007 percent of the area impacted on the North Slope.

Impacts to floodplains could occur from river channel crossings by pipelines and roads, which could destroy vegetation where bridge pilings or VSMs were required for the crossing. Construction of a buried pipeline under the river channel would also have impacts to floodplain vegetation in portions of the floodplain where the pipeline was buried. Compared to the No Action Alternative, Alternative B, and the final Preferred Alternative, the increased development under Alternative C would likely result in greater impacts, since additional river crossings would probably be necessary and the likelihood of buried river crossings would also increase. These impacts would be additive with impacts from other developments occurring on the North Slope.

Much of the gravel used for the construction of roads, pads and airstrips on the North Slope has been obtained from deposits in river floodplains. Impacts from these activities include habitat modifications, caused by increased braiding and spreading of flows (Woodward-Clyde Consultants 1980, NRC 2003). Established guidelines have largely restricted gravel mining to deep mining in upland pits, which may be flooded upon abandonment to create aquatic habitat including fish overwintering areas (NRC 2003). Approximately 20 to 285 acres of wetland vegetation are likely to be disturbed by the establishment of gravel extraction sites in the Planning Area. These impacts would be additive with other impacts to floodplains across the North Slope, but the extent of impact would depend on the availability of gravel from upland areas.

Conclusion

Approximately 95 percent of the ACP in the Planning Area consists of wetlands; a similar percentage of wetland area was assumed for the North Slope. The ACP is also the area where the most significant oil and gas discoveries have occurred, and where future major discoveries are most likely. In addition, most non-oil and gas development associated with villages and military facilities occurs within this area. Thus, water resources have been effected by

past activities, and will be susceptible to effects from future development, especially spills. New technologies, including use of low-impact equipment and less reliance on gravel roads and pads have reduced the potential for impacts to water resources. However, other technologies, including use of ice roads and pads, may have effects on water resources that are not well understood, but could be substantial long-term. Cumulative effects from human-induced activities on the North Slope, coupled with the potential cumulative effects of global climate change, could result in substantial alteration of North Slope wetland soil, water, and vegetation in the future.

4.7.7.7 Fish

Freshwater and Anadromous/Amphidromous Fish

The life cycles of freshwater and diadromous fishes on the North Slope are adapted to the region's long winters and low productivity (Craig 1984, 1989a, b; Power 1997). After break-up, fish move quickly during the brief summer into many habitats, often at great distances from the wintering area. For example, Arctic cisco from the Colville River can return to spawning areas more than 370 miles from the wintering area (Gallaway and Fechhelm 2000). Locating a suitable wintering area at the end of the summer is critical to survival. Craig (1989a, b) estimated that substantially less than 5 percent of stream habitat remains available to fish by late winter. These widespread movements, and the greatly restricted area of habitat available to fish in winter, make many of these species highly vulnerable to the effects of oil and gas exploration and development.

A number of effects could impact fish on the North Slope and accumulate. These include subsistence and commercial fishing; disturbance of fish during seismic operations; loss and alteration of habitat due to exploration and development, including effects from drainage diversions and causeways; spills; and global climate change.

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development. Non-oil and gas activities, including archaeological and paleontological digs, camps associated with scientific studies, recreational use, overland moves by transport vehicles, and use of OHVs such as four-wheel vehicles and snowmachines, have likely caused surface disturbance on less than 100 acres in the Planning Area. Where Caterpillar or similar tractors have been used, or the vegetation has been bladed, scars in the vegetation persist to this day. An estimated 250 acres of tractor trail/tundra scars were created before 1973; about 50 acres remain evident today (NRC 2003).

Of the 17 species taken by subsistence fishermen on the North Slope, Arctic cisco and broad whitefish have the highest subsistence value. Most subsistence fishing occurs during the summer and fall and is especially important to the coastal villages. An average of 40,800 pounds of Arctic cisco was harvested annually from the Colville River Delta each fall from 1985 to 1998, with an additional 7,100 to 8,800 pounds taken near Kaktovik (Craig 1987, Fuller and George 1997). The broad whitefish harvest by North Slope villages is estimated to be more than 62,000 pounds annually (Fuller and George 1997; Hepa et al. 1997), although in some years fish harvests can be substantially larger.

Based on surveys conducted in the late 1980s and early 1990s, Barrow residents harvested from 50,000 to 110,000 pounds of fish per year, or about 11 percent of the total subsistence harvest (see Appendix J). The estimated harvest of whitefish for Barrow in 1989 was over 90,000 pounds (SRBA and ISER 1993). Atqasuk residents harvested approximately 12,000 pounds of fish annually, or 37 percent of their subsistence harvest. Nuiqsut residents harvested from 50,000 to 90,000 pounds of fish annually, or 30 percent of their subsistence harvest. Only a few thousands pounds of fish were harvested annually by Anaktuvuk Pass residents. Small numbers of fish are caught by recreational fishermen during float trips on the Colville River and fishing near villages. Fish harvested for subsistence and recreational purposes comprise only a small portion of the fish population and these effects to fish at the population level would not accumulate.

Some fish habitat has been lost due to construction of DEW-Line sites and other military construction, and residential, commercial, and industrial development associated with villages and airstrips. Approximately

2,500 acres have been disturbed by these developments, but since these sites were often located on high ground, there would have been only minor loss of fish habitat.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration

When seismic exploration was conducted with explosives, there was potential for harming fish that were exposed to large, rapid changes in ambient pressure. The advent of vibrating equipment has reduced this concern, because the energy it generates is much less than the energy generated by explosives. The ADFG blasting standards require that the instantaneous change in pressure resulting from any explosion must remain below 0.02 megapaseals (Mpa; 2.7 psi). Results of a recent field test involving vibrators on ice, over water, indicate that peak pressure changes below a vibrator can be as low as 0.01 Mpa (1.57 psi). In addition, the energy velocity appears to be many times slower than velocities known to harm fish. When converted to energy, the Vibroseis machines transfer many times less energy to the water than do airgun arrays. It is unlikely that impacts to fish populations have accumulated from seismic surveys.

As discussed above, seismic vehicles have impacted the tundra and could have impacted some fish habitat. Use of newer technologies, including use of vehicles that apply less pressure to the ground and restricting travel to periods when there is adequate snow and frost cover to protect vegetation, have reduced the level of impacts to tundra and potential fish habitat. Lease stipulations that require operators to avoid streams and minimize damage to riparian areas also benefited fish.

Other potential sources of fish habitat loss included exploration sites with gravel pads, disturbed areas around these pads, exploration airstrips, and gravel exploration roads. Approximately 1,200 acres have been impacted by these sites in the past, and 740 acres of disturbance were still evident in 2001. Most of these sites were developed before 1977, thus their effects on the landscape have persisted for decades, and are likely to persist for several more.

Habitat Loss

Peat and gravel roads and pads, and gravel mines have caused the direct loss of fish habitat, and also led to the indirect loss of fish habitat due to erosion and sedimentation along streams and rivers, and alternation of natural drainage patterns. Through 2001, over 500 acres of peat roads still showed evidence of disturbance, even though most of these roads were constructed over 30 years ago. Gravel has been used to construct over 9,200 acres of roads and pads, while gravel mines have impacted another 6,360 acres. Although much of this development would have occurred in upland areas, over 5,000 acres of mines were associated with streams and rivers (NRC 2003).

Drainage Patterns

Drainage patterns are altered by the construction of roads or pads in or across wetlands or drainage areas. To date, over 9,200 acres of gravel pads and roads, and over 600 miles of roadways, have been constructed in association with oil-field development on the North Slope. In addition to causing the loss of some fish habitat, much of the gravel fill has been in wetlands where cross-pad drainage has been blocked by road construction. During spring ice break-up, there is substantial flow across expansive wetlands into lakes and streams. When long stretches of gravel road or pad interrupt flow, the difference in water surface elevation from one side of the pad or road to the other can produce high-velocity water flow in the cross-pad/road drainage structures, usually culverts, which can inhibit upstream fish movements and delay migration to various summer habitats. The delays are particularly problematic for Arctic grayling, which spawn shortly after break-up and often undertake long, rapid migrations from wintering areas to spawning sites.

An opposite effect can occur in mid- to late summer when stream flow is low. Fish that disperse during or after break-up must leave small drainages and shallow lakes to reach wintering areas before those waters freeze because there are often limited or no opportunities for overwintering within the habitats used for summer feeding. Fish that cannot leave would freeze. An inadequate number or improper placing of culverts or modifications to the stream

bed can cause flow to go below the surface or to be spread too shallow to allow downstream movement when flow levels are reduced in late summer.

Through 2001, nearly 1,400 culverts had been installed on the North Slope (NRC 2003). If not properly installed or sized, water flows can be affected or ice jams can form, impacting fish habitat. Typically, bridges are used where flows exceed 500 cfs, and 60-inch-diameter line pipes are proposed, instead of culverts, for the Alpine Satellite Development (USDOI BLM 2004c). If not correctly sized, engineered, or constructed, impacts to fish associated with bridges, pipes, and culverts would persist and accumulate.

Approximately 4,500 acres of gravel mines have been reclaimed, some to provide deepwater habitat for fish; much of the gravel was obtained from gravel deposits within floodplains. But concerns arising from this practice prompted the USFWS to study the effects of floodplain gravel mining on the floodplains physical and biotic processes (Woodward-Clyde Consultants 1980). The study identified numerous examples of habitat modification, including increased channel braiding, loss of wintering areas, spreading of flow, and restriction of fish movements, such as fish mortality caused by stranding. The study also set forth guidelines for gravel mining to minimize floodplain damage (Joyce et al. 1980). In response to agency concerns, and the results of the USFWS study, new gravel mines have primarily been sited in upland sites since the 1980s. Of the 5,080 acres of gravel mines sited in rivers, all but 350 acres were developed before 1973. One benefit of these pits is that they provide freshwater wintering habitat for fish. Since 1989, Arctic grayling have been stocked in several deep gravel pits that now provide fish habitat. According to the NRC (2003), the positive effects to fish from gravel pits likely outweigh the negative effects, and these effects persist today where gravel pits once were.

Water Withdrawal

Use of fresh water has increased in recent years because of expanded oil-field development and increased exploration. In the early years of exploration, water was obtained from any source, including rivers during winter. Bendock (1977 *in* Winters et al. 1988) documented water withdrawals from the Sagavanirktok River that depleted water in wintering areas and increased mortality to fish in the area. Much of the water needed in the established oil fields is now obtained from reservoirs that are replenished with runoff during spring ice breakup; most of the water used in exploration is from lakes.

Ice thickness has a great influence on the distribution of fish in lakes across the ACP. Most lakes in the existing development area between the Colville and Sagavanirktok rivers are less than 6 feet deep, few fish are present and effects have been minimal. As development spreads into regions with deeper lakes, such as the Colville River Delta and the eastern part the National Petroleum Reserve – Alaska, there is greater potential for having fish populations within lakes. Under current ADFG and BLM policies, water withdrawals from fish-bearing lakes are limited to 15 percent of the estimated minimum winter water volume. This policy was adopted to allow some water use, while preserving most of the water for wintering fish; the criterion was set arbitrarily because there were no data to support a different use. Fish populations in lakes subjected to this maximum allowable withdrawal appear to be unaffected, but data on consequences are limited, and there has been no research to determine the effects of withdrawals on populations of invertebrates in the lakes or on vertebrate food supplies.

The current practice for ice road construction is to permit withdrawals from a large number of lakes along a desired route, then to allow the ice road contractor to draw from the nearest suitable lake. This allows for maximum construction flexibility, but it complicates the tracking of withdrawal volumes: much more water is permitted for withdrawal than is used. Between 1998 and 2001, for example, Phillips Alaska obtained annual permits for withdrawals of more than 2.2 billion gallons, but used less than 240 million gallons in any given year.

An additional issue associated with water withdrawals from fish-bearing lakes is the potential to remove fish during pumping. In recent years, as construction of ice roads has increased in the vicinity of Nuiqsut, residents have reported finding fish frozen into the roads. Contracts issued for ice road construction specify that water is to be screened to avoid removing fish, but contractors sometimes failed to install screens. In some cases, sampling to identify the presence of fish before water withdrawal used gear that was not appropriate for detecting smaller species, such as ninespine stickleback and Alaska blackfish. The problem can be aggravated when lighted shacks

are placed over the hole from which water is withdrawn. Thus, effects to fish from water withdrawals have accumulated, but have not adversely affected fish populations.

Causeways and Intake Pipes

Coastal development that poses the greatest risk of causing effects that accumulate in nearshore habitats includes facilities that change physical conditions that are important to nearshore biota. Such structures include causeways that modify water temperature and salinity.

Two major causeways have been built into the nearshore region to support oil-field activities. The Prudhoe Bay West Dock was built in the winter of 1974-1975, primarily to support off-loading of large modules used to develop the field; it was modified in 1981 to support the intake structure for the Prudhoe Bay waterflood facility to supply water needed for injection into the oil reservoirs. The causeway runs from the east end of Simpson Lagoon to the west entrance to Prudhoe Bay. The second major causeway, in the middle of the Sagavanirktok River Delta, was built to support facilities for the Endicott oilfield.

Accumulation of effects is a concern when multiple causeways affect the same fish population. The migratory stocks found along the Beaufort Sea coast are likely to encounter multiple causeways during their annual summer feeding movements. From the late 1970s to the late 1980s, there was substantial concern over the potential effects of the two long causeways to migrating fishes, especially for the integrity of the nearshore band of relatively warm, low salinity coastal water that is used by migrating fish Craig (1984). Causeways built perpendicular to shore disrupt the east-west flow of the coastal currents, and can alter fish movements within the band. Permits issued by the USACE and the NSB for causeway construction included lease stipulations for monitoring the effects of the causeway on fish movements and habitat, among other issues. Initial monitoring studied the West Dock Causeway between 1981 and 1984 and then the West Dock and Endicott causeways between 1985 and 1987. In 1988, the USACE concluded that although there were effects to fish, significant harm to habitat had been demonstrated and that further monitoring for effects on fish populations was not required (Hachmeister 1991). Those effects, as summarized by Ross (1988), included degradation of habitat quality in the nearshore region, alteration to fish movements and fish use of the Prudhoe Bay area, and changes to fish community structure.

The NSB's program showed that the causeways, particularly the West Dock Causeway, interfered with the eastward movement of juvenile least ciscos and humpback whitefish moving from the Colville River into the Prudhoe Bay area during early summer (Moulton et al. 1986a; Fechhelm et al. 1989; Fechhelm 1999; Gallaway and Fechhelm 2000). Juvenile Dolly Varden might also be affected (Hachmeister et al. 1991). The movement of young-of-the-year Arctic cisco from the Mackenzie River into the Alaskan Beaufort Sea region did not appear to be affected by the causeways. Retrofitting of breaches in both causeways in 1994 and 1996 appeared to reduce the effect of the interference to least cisco and humpback whitefish migrations (Fechhelm 1999).

In addition to the causeways, large intake pipes are used to withdraw water from the nearshore region. The Prudhoe Bay waterflood facility, constructed in 1981, can supply 92.4 million gallons of seawater per day. There are also seawater intakes at Endicott (11.6 million gallons per day), and Kuparuk (25.2 million gallons per day). Monitoring of the intakes and marine bypass systems was conducted after start-up for the Prudhoe Bay and Kuparuk waterflood facilities from 1984 to 1987 to assess fish entrapment in intake structures (Dames and Moore 1985-1987). Fish were rarely observed during the monitoring studies, and most of those that entered the system passed successfully. However, approximately 1.5 million fish larvae of nine species were estimated to have been entrapped in the Prudhoe Bay facility in 1985. The intakes were judged to performing as designed, and monitoring was discontinued after 1987.

Spills. Overall, the effects of spills on fish have not accumulated on the North Slope because the spills have been small and cleanup and rehabilitation efforts have generally been successful (NRC 2003).

Summary of Past Effects and Their Accumulation. Non-oil and gas activities, including development and subsistence and recreational fishing have impacted fish and their habitat, but these effects have been minor and have likely not had an effect on fish that persists today.

The energy produced by vibration equipment used to acquire seismic data has not been an issue because the vibrations are below threshold known to affect fish in streams and lakes crossed during seismic investigations.

Approximately 2,500 acres of direct impacts to uplands and wetlands from non-oil and gas activities persist today. Oil and gas activities have caused approximately 12,000 acres of direct impacts to uplands and wetlands that persist today; another 18,000 acres of indirect impacts have also occurred, some of which persist today and affect water bodies. These effects accumulate, but do not appear to have adversely affected fish populations on the North Slope. During the early years of development, gravel mining for roads and pads often interrupted both ice sheet flow and stream flows, and hence fish movement. The permitting process and the regulatory environment for protecting fish have improved over time and are generally effective. Proper construction and placement of bridges and culverts have greatly reduced effects but have not eliminated them; these effects have accumulated.

Little is known on the effects on fish of water withdrawals from lakes. Some fish have been harmed or killed during water extraction, but these numbers would be very small and would not accumulate. Existing causeways near Prudhoe Bay do not affect the westward recruitment of Arctic cisco into the Colville River and associated rearing areas. Blockage of young least cisco and whitefish moving eastward from Colville to Prudhoe Bay was demonstrated under certain wind conditions in some years at the West Dock causeway. This blockage was reduced by the breach retrofit installed in 1996. The effectiveness of breach design for existing or new causeways has not been resolved. Breaches are effective, but there is more to be learned about the best or most appropriate design and placement of them. Seawater intakes have been designed to prevent entrapment of fishes. There is potential that the effects of causeways do accumulate for fish, although more studies are needed.

Future Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development. Some fish habitat would be lost due to growth of villages and from new developments on the North Slope. Subsistence and recreational fishing will continue to remove a small portion of the fish population. Although some of these effects would accumulate, their impact on fish populations would be minor.

Although not part of the development scenario for the Planning Area, it is reasonably foreseeable that the State of Alaska would build a new highway from the existing oil fields or the TAPS to the Planning Area. One proposal is to build a road from the Spine Road to Nuiqsut. Assuming a length of 18 miles (to connect the existing Spine Road to a proposed bridge at the Colville River) and assuming the same impacts for construction as for other gravel roads and pads, such a road would cover approximately 80 acres for the road and 20 acres would be lost from development of gravel mines. Another proposal is to build a road from TAPS to the Planning Area. This road could be 100 or more miles in length, and would directly impact 425 acres or morel. An additional 80 acres could be impacted due to development of gravel mines. These roads would likely cross numerous water bodies, and potentially several lakes. Thus, erosion associated with soil disturbance, and spills from equipment and construction activities, could impact fish habitat. In addition, if not properly engineered and installed, culverts and bridges could affect fish habitat and movements.

Other impacts from a new road would be related to added fishing pressure. Extending and opening the road to the public would increase public access from the Dalton Highway (assuming the state portion of the road is open to the public) to the Colville River for fishing and other recreational activities. There would be increased fishing pressure on, and harvest, from fish-bearing rivers that cross the road. Lakes in close proximity to the road would also receive increased fishing pressure. Species such as lake trout, Arctic grayling, northern pike, burbot, and Arctic char would be targeted. Since fish grow slowly in the Arctic, because of the harsh environmental conditions, fish are more susceptible to over-harvest. The effects of additional fishing pressure would have an effect on fish, but would not accumulate at the population level if management guidelines were implemented and fish harvest limits were enforced.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration

Concerns related to future habitat degradation from seismic train movement are minimal, given lease stipulations in the 1998 Northeast IAP/EIS ROD, those proposed in this Amended IAP/EIS (e.g., equipment operators would cross streams at shallow riffles), and state regulations. Fuel spills associated with seismic work would be expected to consist of small spills of refined fuel that would be unlikely to reach aquatic habitats. The effects of vibration on most overwintering fish should be minimal (short-term avoidance), given the low density of fish in most of the North Slope oil and gas exploration sites during the winter and the short time duration of vibration impulses in any given spot. As a result, increased seismic activity is unlikely to have a measurable effect on fish populations in the future.

Oil and Gas Production and Development

An estimated 4,000 acres could be disturbed from oil and gas development on the North Slope during the next 25 years (Table 4-37). An additional 4,000 acres could be impacted by 2050 if development occurs in the Northwest and South National Petroleum – Reserve. Given the high potential for oil near the coastline of the Planning Area and North Slope, it is likely that wetland would comprise 95 percent of more of the disturbance area, and some of this habitat would be used by fish.

Additional construction outside of the Planning Area necessary to support oil and gas exploration and development in the Planning Area would include an increased number of ice roads and new pipelines. Potential impacts to fish both within and beyond the Planning Area boundaries would be related to water withdrawal and direct habitat loss or indirect disturbance associated with construction of a pipeline. Increased water use, in and of itself, would not necessarily increase impacts to fish species. Effects would be dependent on the location of withdrawal and amount of water used. Assuming that water withdrawals outside the Planning Area would also be limited to 15 percent of the free water volume from lakes that do not freeze solid, impacts to fish would likely limited to localized, short-term, population abundance and distribution changes. Impacts from pipeline construction and the accompanying gravel extraction, with its resultant erosion and sedimentation, would be similar to those described under the action alternatives. Though dependent on the actual level and location of implementation, the increase in the overall effect of construction-related activities in the cumulative case would accumulate, but would have a minor affect on fish populations.

Spills

The cumulative case involves the potential for more oil spills. Many of the projects considered in the cumulative case would be conducted outside of the Planning Area. The additional oil spills associated with some of these projects could affect the migratory and marine fish that use the coastal areas. Offshore oil spills, or those that occur in rivers and move into coastal waters, would be likely to increase oil-related effects on Arctic fish. Cumulative effects would depend on the number, size, and seasonal timing of the spills, concentrations of hydrocarbons, and the life stages of fish exposed to the spills. Lethal effects on fish from oil spills are seldom observed outside of the laboratory environment. For this reason, oil spills are expected to have mostly sublethal effects on the fish affected by them. For example, displacement from oiled water may lead to increased energy expenditures while foraging, with subsequent reduction in growth and reproduction. Juvenile fish that are common in the nearshore area during summer, migratory fish, and nearshore spawners would be among those most likely to experience lethal or sublethal effects. Because in the cumulative case there would be a greater probability of an oil spill contacting coastal waters, it is likely that a greater percentage of fish would be affected. Land-based, cumulative-case oil spills that did not enter coastal waters would be expected to have minor effects on overall fish populations, since the likelihood of a large spill contacting water would be minor. Losses onshore would be greatest in water bodies with limited water exchange.

Abandonment

To date, very little abandonment (except for single exploration or development wells) has occurred anywhere on the North Slope. Restoration of other types of facilities, such as gravel extraction sites and older exploration pads, has taken place at a small scale at several locations on state lands on the North Slope outside of the Planning Area

(Jorgenson et al 1992; McKendrick et al 1992; Herlugson et al 1996; McKendrick 1996). These restoration efforts are being closely monitored in an effort to determine the most appropriate and effective methods for restoration.

As with roads, abandonment of bridges and culverts would occur once the economic life of the oil fields had passed. Because the bridges and culverts are an integral portion of the proposed road network, the fate of the bridges would likely be determined by the fate of the road network. If roads were left in place, but not with the intention that they be maintained for continued use, culverts could be removed and the gravel pads breached to facilitate water flow. If culverts, bridges, or pipes were left in place at abandonment, there is potential that these structures would deteriorate and become clogged, inhibiting water flow and fish passage. If this occurred, the effects to fish would accumulate and persist indefinitely.

Open-pit gravel mine rehabilitation typically involves converting mine sites to lakes, with a channel usually cut between the pit and a stream or river so the site can be accessible to fish. Such sites create potential overwintering habitat for fish, but they also result in the permanent loss of the original habitats.

Global Climate Change

Ice cover in the Arctic Ocean has been shrinking about 3 percent per decade during the past 2 decades (Johannessen et al. 1999). If this trend continues, the sea ice would disappear entirely during the summer in about 50 years. Some species of fish would benefit from this trend, especially those that reside in warmer waters, while cold-water species would be forced further north. These effects would accumulate, but the adverse effects to species in decline could be compensated for, to some degree, by reducing the commercial fish harvest of these species. Shifts in species and their numbers could affect subsistence harvests on the North Slope.

Contribution of Amendment Alternatives to Cumulative Effects

Seismic activities could disturb up to 250,000 acres of soil under the action alternatives. The number of acres disturbed annually would be similar to the amount of acreage that has been disturbed annually by seismic surveys during the past decade in the Planning Area. It is assumed that seismic train moves would originate from Kuparuk and traverse about 30 miles east of the Planning Area in each direction. However, much of this distance would be along an ice road that is built annually from Kuparuk to the Alpine oil field, limiting most impacts of the seismic train outside of the Planning Area to the minor impacts associated with ice roads. Nonetheless, impacts associated with seismic operations, including water withdrawals to make ice roads, occurring in the Northeast National Petroleum Reserve – Alaska would be additive with impacts from seismic operations in other portions of the National Petroleum Reserve – Alaska and across the North Slope.

If oil prices average $25 per bbl, development in the Planning Area would directly impact 300, 1,120, 1,380, and 920 acres for alternatives A through D, respectively, and indirectly impact 400 to 2,400 acres (1,600 acres under the final Preferred Alternative). If development occurred in the northern portion of the Planning Area, 95 percent or more of the impacted area would likely be wetland, and a portion would be fish habitat. The loss of fish habitat would persist. Impacts associated with the Planning Area would be additive to past, present, and reasonably foreseeable future soil impacts on the North Slope. If global climate change persists, the effects to fish could be much greater than predicted, although some species are expected to benefit from global climate change. A portion of the disturbance area would be for gravel extraction (approximately 20 to 300 acres; 140 acres for the final Preferred Alternative at an oil price of $25/bbl). Although the current emphasis is to extract gravel from upland sites, it could still be possible to create potential overwintering habitat at these sites when abandoned.

Conclusion

Wide-ranging increased impacts to Arctic fish populations found on the North Slope would not be anticipated based on the cumulative analysis, but some effects to fish described above would accumulate. Localized changes to fish populations in the vicinity of a road connecting to the Dalton Highway would be possible. Synergistic impacts to fish from disturbance related to oil and gas production under any of the alternatives in this amendment are not anticipated. Beneficial effects related to material extraction at gravel sites would be possible in certain situations.

Past reclamation of deep pits that have been mined has proved beneficial when new habitat for Arctic fish species has been established. If oil and gas activities occurred in areas with high fish populations, or use by sensitive or important subsistence species, impacts to fish could be greater than impacts predicted based on the amount of area impacted.

4.7.7.8 Birds

About 80 species of birds occur in the Planning Area, and the North Slope provides habitat for millions of birds each year. Primary factors that limit avian populations are habitat loss, disturbances that displace birds from preferred habitat areas, hunting, and predation. An oil spill could cause the direct mortality to birds due to its toxic effects, and indirectly affect habitat. Global climate change is of concern because it may cause shifts in available habitat types, and a concurrent shift in the bird species that use these habitats. Oil and gas exploration and development in the Planning Area are the primary contributing activities in terms of cumulative effects on birds on the North Slope. Other factors that contribute to the cumulative loss of birds include permitted activities such as non-oil and gas overland moves and development, scientific data gathering, and recreational use by the public. In addition, any analysis of cumulative effects to birds must include effects to birds on migration and wintering areas, where impacts to birds could be independent of activities on the North Slope. Because bird populations can show substantial changes among years, it is often difficult to determine if effects are accumulating at the population level, or merely reflect short-term shifts in population numbers.

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Activities that occur on the North Slope and are not directly related to oil and gas development can add to the cumulative impacts to birds. Activities include wildlife research and survey activities, recreation activities, village expansion, spills and other environmental contamination, predation, and subsistence harvest. These impacts are usually localized and would generally affect only small numbers of birds and would not accumulate at the population level.

Research and Survey Activities. Various types of disturbances affect tundra-nesting birds near summer camps. Noise and ground activities disturb feeding, nesting, or brood-rearing birds, causing temporary or permanent displacement from feeding or nesting areas potentially affecting energy budgets and productivity. Although pedestrian traffic has been shown to be particularly disruptive to some waterfowl and raptors (Roseneau et al. 1981; Ritchie 1987; Johnson et al. 2003b), some birds have acclimated to predictable daily activities of camp personnel. Disturbance to birds from aircraft traffic and camp activities is greatest within approximately 2,280 feet of the camps and little or no effect beyond 6,500 feet (Johnson et al. 2003b). Ward et al. (1999) also studied brant response to fixed-wing and rotary-wing aircraft and reported brant response to aircraft at a lateral distance to 3 miles, although the majority of birds responded to aircraft that were within a lateral distance of ½ mile or less. The greatest response to aircraft altitude occurred between 1,000 and 2,500 feet. Tundra-nesting birds near summer camps could suffer mortality or egg loss due to predators attracted to anthropogenic sources of food at camps.

Summer boat traffic occurs on the Colville, Kogosukruk, Kikiakrorak, and Ikpikpuk rivers for recreational or subsistence activities, or to re-supply camps along these rivers. Numerous studies have reported on the effects of boat disturbance to birds (McGarigal et al. 1991; Steidl and Anthony 1996); this activity could potentially affect nesting gyrfalcons, peregrine falcons, and rough-legged hawks in the Colville River Raptor, Passerine, and Moose LUEA and the Ikpikpuk River area. The current levels of boat activities on these rivers have apparently not impacted raptors negatively, as some populations, particularly the peregrine falcon, have been increasing on the ACP in recent years (Ritchie and Wildman 2000).

Aerial surveys for wildlife and to mobilize and re-supply summer camps in the Planning Area could include fixed-wing aircraft surveys for waterfowl and caribou, or helicopter surveys for tagging and subsequent radio-tracking of grizzly bears or caribou. Low-level fixed-wing aerial surveys likely had little effect on birds given the short amount of time aircraft would be in a particular area. Ward et al. (1999) reported a decreasing level of response to aircraft

overflights by brant with increased lateral distance of aircraft. Additionally, pedestrian traffic has been shown to be more disruptive to some waterfowl species than other types of disturbance (Johnson et al. 2003b). The effects to birds from these activities have ranged from temporary displacement from preferred feeding habitats to nest abandonment and loss of production for the breeding season. These effects would be minor and likely would not accumulate at the population level.

Development. Non-oil and gas development at former military sites and in villages has caused the loss of habitat and increased levels of disturbance. These sites also provide a potential starting point for hunting trips. Approximately 2,500 acres have been disturbed, with most of the development along the coastline where large numbers of birds are found. Although there is limited information on historic numbers of birds found in these areas, the population density of some species, including Pacific loons, tundra swans, pintails, and long-tailed ducks is moderately high to high near Barrow and Nuiqsut. Development and loss of habitat and disturbance, coupled with hunting pressure at "Duck Camp" near Barrow, and other recreational and subsistence hunting near other villages, would cause the loss of birds and habitat that would accumulate.

Subsistence. Migratory birds, particularly eider ducks and geese, are an important food source for villages on the North Slope. Bird eggs are also gathered. Waterfowl are hunted during the spring whaling season, during late spring and early summer, and during early fall. In earlier times, Iñupiat resource users harvested flightless molted birds by cooperatively herding them into creeks, and dividing the harvest between the work group members. One resident remembered doing this cooperative herding as recently as the late 1940s at Oliktok Point. In the past, Nuiqsut people gathered and stored eggs from waterfowl nests on the tundra. According to 2003 interviews, eggs are no longer gathered, and certain species of waterfowl are not harvested. Some residents indicated that they do not eat certain varieties of ducks (e.g. oldsquaws and pintails), while many choose to avoid harvesting black brant and spectacled eiders because they are threatened or species of concern.

Barrow residents harvested about 8,000 pounds of waterfowl annually from 1962 to 1982, and 20,000 to 30,000 pounds of waterfowl annually during the late 1980s and early 1990s; waterfowl accounted for about 4 percent of the subsistence harvest (see Appendix J). Atqasuk hunters harvest migratory birds, especially white-fronted geese, during spring through fall. Bird harvests amount to a few hundred pounds per year, and about 3 percent of the subsistence harvest. Nuiqsut residents harvest about 3,000 to 8,000 pounds of waterfowl and their eggs annually, about 5 percent of the subsistence harvest. Much of the harvest occurs along Fish and Judy creeks. Birds and their eggs comprise less than 2 percent of the subsistence diet of Anaktuvuk Pass residents. Subsistence hunting, especially egg gathering and goose herding, has the potential to adversely impact local populations of waterfowl, although the number of birds harvested would be negligible in the context of the continent-wide harvest.

Oil and Gas Exploration and Development Activities

Seismic Activity and Exploration. The two primary factors associated with seismic activities and exploration that could affect birds on the North Slope are loss of habitat and disturbance. Most seismic surveys and exploration drilling activities occur during the winter months when most birds are not present in the Planning Area. Therefore, these activities would have no direct impacts that would accumulate for most species. A few species, including snowy owl, gyrfalcon, ptarmigan, and common raven, which may be present in the Planning Area during winter, could be temporarily displaced from preferred feeding areas by oil and gas exploration activities. Given that these activities occurred within only a small portion of the North Slope, it is unlikely that these effects have accumulated.

The use of airguns for boat-based seismic work in Teshekpuk Lake likely displaced loons and waterfowl from preferred feeding habitats while surveys were being conducted. However, these surveys have only occurred a few times in the past, and it is unlikely that effects to birds have accumulated.

Seismic surveys have been conducted over most of the North Slope since the 1940s. Rolligons and track vehicles used during seismic exploration have left tracks on tundra habitats, but less than 100 acres of habitat has scars persisting today that could result in habitat loss for birds. Wet areas are less likely to be affected than dry areas (Walker 1996). Studies of seismic and camp-move trails created in the 1980s showed that only a small portion of

seismic trails were still in evidence 8 years later, but that 5 percent of camp-move trails still showed moderate to high disturbance. Use of lightweight vehicles, dispersing traffic patterns, minimizing sharp turns, and requiring surveys to be done when snow and frost cover is adequate to protect the tundra have helped to minimize damage to vegetation used by birds (Walker 1996).

Other sources of vegetative loss include gravel pads, airstrips, roads and disturbances near gravel structures at exploration sites. Peat roads that were constructed in the 1960s also caused disturbances to tundra habitats that persist today. However, some evidence suggests that bird use of peat roads is similar to that of adjacent areas of undisturbed tundra (TERA 1991). Based on NRC (2003), in 2001, approximately 1,200 acres had been impacted by exploration sites in the past, and 740 acres of disturbance were still evident. Most of these sites were developed before 1977, thus, their effects on the vegetative landscape have persisted for decades, and are likely to persist for several more. As industry has shifted towards use of ice roads and ice pads during exploration, loss of habitat has slowed greatly.

Water used in the construction of ice roads and pads would be withdrawn from deep lakes in areas adjacent to the road and pad locations. Winter water withdrawal could alter lake levels and adjacent birds habitats, although flooding and recharge during spring break-up would likely minimize the potential for long-term effects (Rovansek et al. 1996). Since use of lakes in the past has varied, and few lakes would have had water withdrawn over several years, it seems unlikely that the effects of past use of lakes for water withdrawals would accumulate.

Infrastructure and Road and Pad Construction. Effects to birds habitat from road and pad construction and gravel mining, and disturbance associated with development and production activities, have occurred in the past and persist today. Gravel roads, gravel pads, and gravel mines have caused the direct loss of avian habitat, and also have led to the indirect loss of habitat from the effects of road dust and alteration of natural drainage patterns. Although over 500 acres of peat roads still show evidence of disturbance, it is not clear that this disturbance has resulted in negative impacts to birds. Gravel footprints have impacted over 9,200 acres, while gravel mines have impacted another 6,360 acres of vegetation. Of this, all but 70 acres of gravel footprint persisted in 2001, but over 4,500 acres of gravel mines were reclaimed. Loss of habitat has accumulated and could limit local bird populations.

The passage of vehicle traffic over gravel pads and roads results in dust and gravel being sprayed over vegetation within about 30 feet of the pad or road, and a noticeable dust shadow out to 150 feet or more. Within 30 feet of gravel structures, the dust and gravel can smother vegetation. Based on assumptions used in this amendment, approximately 30 acres of vegetation could be impacted by dust for each 100 acres of development in the Planning Area, suggesting that 2,700 acres of bird habitat may be indirectly affected by existing gravel roads and pads on the North Slope. These impacts are likely to persist as long as vehicle travel occurs on the pads and roads.

Construction of gravel pads, roads, and airstrips has altered the moisture regime of tundra near these structures by changing natural drainage patterns and areas where snow accumulates. These changes alter the species composition of the plant community near gravel structures and adversely affect birds. However, impoundments created by road and pad construction and dust deposition have created new feeding and brood-rearing habitat that has been beneficial to some bird species. Noel et al. (1996) reported that the areas occupied by impoundments in the Prudhoe Bay area generally supported higher waterfowl densities than the same areas did prior to development. Kertell (1993, 1994) reported few differences in invertebrate numbers and numbers of Pacific loons when comparing use of natural ponds and impoundments in the Prudhoe Bay area. He also reported that ducks were more abundant on impoundments than natural ponds, although this difference was not statistically significant. These effects, both beneficial and adverse, persist today on approximately 18,000 acres of vegetation on the North Slope.

Disturbance. Numerous types of disturbances could result from oil and gas exploration, development, and production activities, including those caused by aircraft, vehicular, pedestrian, and vessel traffic, construction and drilling activities, noise and activity at facilities, and predator attraction. Some level of disturbance to birds from these activities would be unavoidable. Impacts have been most prevalent where facilities were located in habitats with high bird concentrations.

Disturbance to waterfowl from aircraft is well documented (e.g., Schweinsburg 1974; Ward and Stehn 1989, Derksen et al. 1992; McKechnie and Gladwin 1993; Ward et al 1999). Johnson et al. (2003b) conducted the most thorough study of aircraft disturbance to waterfowl in the Arctic at the Alpine field. Responses of birds to aircraft included alert postures, interruption of foraging behavior, and flight. Aircraft disturbances could displace birds from feeding habitats and negatively impact energy budgets. However, an avian monitoring study at the Alpine field showed that successful white-fronted goose nests were generally closer to the Alpine field airstrip, the flight path, and the nearest gravel source than unsuccessful nests, although most comparisons were not substantially different. Johnson et al. (2003b) also reported on tundra swans and yellow-billed loons nesting in proximity to the Alpine field airstrip. Although the potential exists for displacement of some nesting birds near routinely used aircraft landing sites as a result of numerous overflights, landings, and takeoffs, some birds may habituate to routine air traffic.

During post-breeding studies in southwest Alaska, Ward et al. (1999) studied brant response to fixed-wing and rotary-wing aircraft and reported brant response to aircraft at a lateral distance to 3 miles, although the majority of birds responded to aircraft that were within a lateral distance of ½ mile or less. Brant did not habituate to the overflights, and temporary displacement from preferred feeding, brood-rearing, or molting habitats could affect energy budgets of some birds, and incubating birds could be temporarily displaced from nests. These effects may have had short-term impacts to brant and other waterfowl, but impacts to local populations were minor.

Predators. Predators such as glaucous gulls, Arctic foxes, ravens, and grizzly bears could be attracted to anthropogenic food sources associated with summer maintenance of exploratory drilling and seismic equipment, which may cause increased predation pressure on tundra-nesting birds. There is evidence that nesting success for several species of ground-nesting birds may be lower in oil fields than in undeveloped areas (Troy 1996; Anderson et al. 2000; Sedinger and Stickney 2000). Sedinger and Stickney (2000) attributed low brant nest success in oil fields to high predator populations. Johnson (2000) noted a similar relationship for snow geese in some years. Despite the poor production rates, snow goose and brant numbers have increased in oil fields since the early 1980s. Thus, effects of development to snow geese and brant are accumulating, although it is not entirely clear if oil field development has had an adverse (poor reproductive success) or positive (increased population size and growth rates) effect. Impacts to brant and snow geese on the North Slope may be the result of factors outside the breeding and molting grounds.

Increases in the number of predators in areas of development could have an additive impact on the effects of predation on bird populations, particularly for species with low or declining populations or species of special concern such as yellow-billed loon, long-tailed duck, and buff-breasted sandpiper. In recent years, North Slope oil field developers have installed predator-proof dumpsters to minimize attraction of predators to development. This policy has apparently been successful at the Alpine field, where Johnson et al. (2003b) reported no increase in the numbers of predator species, other than the common raven, after development.

Collisions. Bird mortality has resulted from collisions with buildings, vehicles, aircraft, vessels, towers, pipelines, platforms, or other structures associated with onshore and offshore oil and gas development. Offshore activities are most likely to impact birds during the late summer/fall staging period, when relatively large numbers of loons, long-tailed ducks, eiders, and other waterfowl are staging and molting in marine areas. Migration pathways may include areas where offshore production facilities are constructed, so collisions with offshore structures, and with vessel and helicopter traffic used for transport of personnel and equipment or responding to an oil spill, could occur. Bird collisions with vehicles, buildings or oil field infrastructure probably do not represent a significant source of bird mortality at the population level. However, bird losses due to collisions in developed areas accumulate with increases in development and add incrementally to other impacts.

Spills. No large oil spills have occurred on the North Slope. Small spills have occurred but cleanup and rehabilitation efforts have been successful and relatively few birds have been impacted (NRC 2003). The cumulative effects of oil spills on the North Slope have added only incrementally to impacts on birds.

Marine Activities. Offshore oil exploration and development, which occurs in both state and federal offshore marine waters of the North Slope, rely on helicopter and barge traffic more often than on fixed-wing flights. Most of this activity occurs during the winter when birds are not present. However, helicopter activity, barge and crew vessel traffic, and spill response training activities do occur during the summer. During the summer open-water seasons of 2001 and 2002 at the Northstar development off Prudhoe Bay, helicopter activity ranged from 477 to 989 round trips, crew vessel activity ranged from 469 to 824 round trips, and barge traffic ranged from 63 to 64 round trips (Williams 2002, Williams and Rodrigues 2003). Vessel traffic not related to oil development also occurs in marine waters off the coast of the North Slope. These activities have displaced marine birds in the past, but it is unlikely that effects have accumulated.

Factors Outside of the North Slope

Numerous factors could affect birds at various locations around the world. Various types of contaminants and toxins from industrial and agricultural activities can enter either terrestrial or marine environments and affect bird mortality or reproductive success. Oil spills have been an obvious source of bird mortality at numerous locations around the world. Commercial fishing activities have caused changes in predator-prey relationships that could affect wintering loons and waterfowl that feed in offshore marine habitats. Marine birds could also become entangled in fishing gear currently being used in commercial fishing activities or in abandoned gear that persists in marine environments. Many waterfowl species are hunted for sport during the fall migration and on the wintering grounds. Subsistence users take waterfowl or other bird species during spring and fall hunts, as well as eggs during the nesting season. There is evidence that contamination of feeding habitat with spent lead shot may result in lead poisoning of waterfowl in some areas including the Y-K delta. Development along migration corridors and in wintering areas may result in habitat loss or disturbance that add to the cumulative impacts on bird populations. All of these factors can add to the cumulative loss of individual birds, and in some instances, can have population-level effects.

Summary of Past Impacts and Their Accumulation

Approximately 2,500 acres of direct impacts, and about 5,000 acres of indirect impacts to bird habitat from non-oil and gas activities persist today. Oil and gas activities have directly impacted approximately 13,000 acres of bird habitat, and indirectly impacted approximately 21,000 acres of habitat that persist today. Since most of these impacts are associated with ongoing non-oil and gas residential and commercial developments, and oil and gas activities, these impacts to habitat are additive to future impacts and would be likely to persist for several decades or more, in the absence of an active reclamation program. The impacts of predators on bird populations may be slowly waning as industry reduces the amount of predator-attracting garbage in the fields. Other effects, including disturbance, are difficult to measure, but are likely accumulating as the number of developments and the amount of developed area increase. The typical gravel pad and amount of roadway needed to service a development have become smaller over time, reducing the amount of bird habitat lost due to development as compared to past levels. However, new development often relies on aircraft support for transportation of personnel and equipment that can increase disturbance to feeding, nesting, and molting birds. Habitat loss and disturbance can add incrementally to the impacts of development on birds.

Future Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Non-oil and gas activities, including archaeological and paleontological digs, camps associated with scientific studies, recreational use, overland moves by transport vehicles, and use of OHVs, such as four-wheel vehicles and snowmachines, would continue to result in the loss of minor amounts of bird habitat and cause disturbance to birds. In most cases, loss of habitat would be temporary, lasting only a few years. DEW-Line sites and other military facilities, villages, airstrips, and other non-oil and gas infrastructure are likely to persist into the indefinite future. Villages are likely to increase in size, causing the loss of additional habitat.

Although not part of the development scenario for the Planning Area, it is reasonably foreseeable that the State of Alaska would build a new highway from the existing oil fields or the TAPS to the Planning Area. One proposal is to build a road from the Spine Road to Nuiqsut. Assuming a length of 18 miles (to connect the existing Spine Road to a proposed bridge at the Colville River) and assuming the same impacts for construction as for other gravel roads and pads, such a road would cover approximately 80 acres for the road and 20 acres would be lost as bird habitat from development of gravel mines. Another proposal is to build a road from TAPS to the Planning Area. This road could be 100 or more miles in length, and would directly impact 425 acres or more. An additional 80 acres could be impacted due to development of gravel mines. Erosion associated with soil disturbance, and spills from equipment and construction activities, could impact bird habitat. The road may increase the number of visitors and hunters to the Planning Area, resulting in increased disturbance and hunting pressure to birds.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration. About 1,300 miles of seismic trails are expected to be added each year. Based on previous seismic exploration activity, this activity could impact up to 100 acres of habitat annually, with moderate to high levels of disturbance continuing a decade later. However, with the use of newer seismic technology, it is likely that impacts to vegetation that persist for a decade or more would be substantially less than this estimate (Jorgenson et al. 2003).

Other sources of habitat loss include exploration sites with gravel pads, disturbed areas around these pads, and airstrips and gravel roads at exploration sites. In recent years, gravel structures for exploration activity have been replaced by ice roads, airstrips, and drilling pads to reduce costs and environmental effects of gravel construction (Johnson and Collins 1980, Hazen 1997). As a result, the long-term effects of exploration activities are likely to affect only a small amount of habitat, although effects would accumulate.

Oil and Gas Roads and Infrastructure. Future development activities in the northwestern and southern portions of the National Petroleum Reserve – Alaska, federal and state offshore oil development (through the construction of supporting onshore infrastructure), state onshore oil development, and oil transportation could contribute to cumulative impacts on birds. All of these activities involve construction of infrastructure that would destroy habitat within the immediate footprint of the project, and indirectly affect bird habitat through dust deposition, changes in natural drainage patterns, thermokarst, and snow drifting.

Although the increase in the amount of area disturbed by oil and gas development has slowed dramatically in recent years, it is estimated that an additional 3,500 acres would be covered by gravel, and 500 acres impacted by gravel mines, in the next 25 years, much of this in the Planning Area. Approximately 9,200 acres would be indirectly affected by dust, changes in hydrology, and thermokarst. An additional 4,000 acres of bird habitat could be directly impacted by oil and gas activities between 2030 and 2055; another 9,200 acres would be indirectly impacted by development.

These impacts are additive to the impacts to vegetation that have accumulated in the past and persist today, but in the context of the ACP and North Slope, these cumulative impacts would be small. Based on direct (21,000 acres) and indirect (36,000 acres) impacts that could still persist in 2050, direct and indirect impacts to bird habitat from activities on the North Slope would impact approximately 0.43 percent of the ACP and 0.10 percent of the North Slope. These estimates do not take into account the quality of habitat that would be impacted on the North Slope. However, it is likely that the focus of future oil and gas exploration and development would be within the Barrow Arch, which is located in the ACP. Highest population densities of many species of waterfowl and shorebirds are also found in this area; thus, impacts to birds from development would likely be much greater than if estimates of impacts are based solely on size of the facility footprint.

Disturbance. It is reasonable to assume that with increased development would come increased disturbance to birds. Although there is no clear indication that disturbance effects have accumulated to the point that they are adversely affecting bird populations, the effects of future developments would be additive to effects of present and past development. If birds are displaced from prime habitat by loss of habitat to gravel infrastructure, and

disturbance further displaces birds, the effects of displacement and disturbance could result in energetic costs that reduce survival and productivity. These losses of individual birds would accumulate, and could persist as long as development occurred on the North Slope.

Predators. During the early years of oil field development, it is likely that predators were attracted to development by anthropogenic sources of food and shelter. Based on policies implemented by the BLM and private industry to discourage attraction of predators to areas of development, the effects of predators on birds are likely to stabilize or decrease over time. This policy has been successful at the Alpine field, where Johnson et al. (2003b) reported no increase in the numbers of most predator species, except ravens, after development.

Collisions. Bird mortality from collisions with buildings, vehicles, aircraft, vessels, towers, pipelines, platforms, or other structures associated with onshore and offshore oil and gas development is likely to persist into the future, and may increase with increasing levels of development. However, industry has implemented practices, including providing better lighting of facilities, burying power lines, and attaching power lines to pipelines, in an attempt to reduce the number of bird collisions oil and gas infrastructure. Losses from collisions are predicted to be small and would not adversely affect bird populations.

Spills. The oil industry is required to have oil spill response and clean-up capabilities, and small spills on lands or waters in the Planning Area or in existing or future North Slope oil fields are expected to be contained and cleaned up before substantial bird loss can occur. In addition to mortality through direct contact with oil, some mortality could result through ingestion of contaminants in food and water, and from the cumulative effects of the numerous small spills expected from the operation of any oil field.

A large onshore spill released in the Planning Area during the summer season could affect loons, waterfowl, shorebirds, and other bird groups. In the immediate vicinity of the spill, some habitat contacted by oil would become unsuitable for bird use, and oil entering freshwater aquatic habitats could spread more widely, potentially entering river deltas and nearshore marine habitats. Direct mortality could occur from loss of insulating capabilities of feathers should birds come in contact with oil, or from ingestion of contaminated prey. Oil that came in contact with eggs, either directly or through contact with partially oiled feathers of incubating adults, could negatively impact embryonic development. These effects would be additive to the effects of a spill in the existing North Slope oil fields, or to the effects of potential future spills that could occur in the Northwest and South National Petroleum Reserve – Alaska, if these areas were developed.

If future oil field development were to occur in state or federal marine waters offshore of the Planning Area, there would be a minor probability of a large oil spill. If one or more spills were to occur, substantial losses to loons and waterfowl could result if oil were released during the summer/fall season when large flocks of these birds were present. Large numbers of molting waterfowl are known to use the lagoon systems in offshore areas of the Beaufort and Chukchi seas. Thousands of molting or staging loons and waterfowl could be impacted by an offshore spill occurring in areas of high bird use, such as the lagoon system near Prudhoe Bay in the central Beaufort Sea or in Kasegaluk Lagoon in the Chukchi Sea. An offshore spill could also affect feeding habitats in littoral habitats, such as extensive mudflats in the Colville River Delta, which are used by staging shorebirds. The Colville River delta supports thousands of postbreeding shorebirds, the most abundant of which is dunlin (Andres 1994). The *arcticola* subspecies of dunlin is considered to be highly imperiled (Brown et al. 2001). An oil spill could also contaminate prey populations in foraging areas at any time of year, which could result in secondary impacts to loons, waterfowl, and shorebirds by affecting productivity and/or survival.

Tanker spills of crude oil from oil fields in the Planning Area could impact birds in marine habitats along the entire tanker route from the port at Valdez to West Coast refineries. A large oil spill in the Prince William Sound area, similar to the Exxon Valdez spill in 1989, would impact many thousands of waterfowl and marine birds at any time of the year. Large numbers of loons and waterfowl use Prince William Sound as a migratory stopover or wintering area. The Copper River Delta is a migratory stopover area for millions of shorebirds during spring and fall migration; if an oil spill were to spread to this area, it could impact many thousands of birds. Marine birds and waterfowl could also be impacted by an oil spill in the Gulf of Alaska or in open water or bay habitats along the

Pacific Coast of Canada, Washington, Oregon, and California. Oil spills occurring in coastal areas would likely produce greater impacts to birds than a spill occurring several hundred miles offshore, where bird densities are much lower. Spills, such as the Exxon Valdez spill and many smaller spills, have already caused extensive bird mortality in many of these areas. The actual numbers of birds impacted by an oil spill is likely much higher than the number of oiled carcasses recovered, because the carcasses of many oiled birds may never be recovered. The length of time required for populations to recover and the lingering effects of contamination varies among species.

Oil produced as a result of development in the Planning Area would contribute to less than 13 percent of future spills from TAPS, but would increase the number of onshore oil spills and would likely impact tundra systems in some instances. The amount of oil produced on the North Slope under the reasonably foreseeable future scenario is likely to continue to trend downward. As oil production slows, coupled with improvement in spill prevention and control technologies and training, effects to birds should decline over time.

Marine Activities. Offshore oil exploration and development is likely to slowly trend downward, reducing the risks to birds from offshore development over time. However, development near the coastline in the National Petroleum Reserve – Alaska and elsewhere on the North Slope would cause increased vessel traffic in the Beaufort Sea. Global climate change could increase the duration of the open-water period and vessel traffic could occur in the region for longer periods of time each year. As a result, effects to birds from vessel traffic and disturbance is likely to persist near current levels into the foreseeable future, and may even increase. This traffic could impact bird habitat use and behavior and cause the death or injury to some individuals, and impact energy budgets and the ability of some birds to store fat prior to migration.

Abandonment. The impacts of abandonment and rehabilitation of oil fields on birds would be similar in many respects to those incurred by construction activity. Activities occurring in the winter would cause little disturbance or displacement, because most species would be absent from the area. However, the melting of ice roads could be delayed, compared to surrounding tundra, causing impoundments of water. Delay in the melting of ice roads, compared to the surrounding tundra, could also cause either complete loss of nesting habitat for a season or compaction of vegetation, which would reduce the quality of the nesting habitat for a nesting season. Such impacts would only affect nesting in the summer following ice road use, and would be minor. Summer road and air traffic generated by abandonment and rehabilitation activities could cause disturbance, displacement, and mortality to birds that would be similar to, and at the same levels as that caused by traffic during construction and operations. If pads, roads, and airstrips were not revegetated, their value to birds would be lessened. If they were revegetated without removing the gravel, the habitat would not return to its current utility for most birds of the area. If gravel was removed, habitat similar to that currently existing in the area could be created and used by birds, though the precise mix of habitat types would likely not be the same as what prevailed at the time of disturbance. The effects of habitat loss would accumulate, as described above, to the extent that habitats were not, or could not be, restored to their original condition.

Other Factors on the North Slope

Numerous other factors could add to cumulative impacts on bird populations. Subsistence harvest of waterfowl and their eggs continues to impact these species, although overall numbers of birds and eggs taken over their entire range are not known. Aside from direct mortality due to subsistence harvest, the accumulation of lead shot in waterfowl foraging habitat in the Y-K Delta may be impacting waterfowl survival. Although the proposed development scenario does not include a road to connect Nuiqsut with roads in the Planning Area, future construction of such a road could allow access that would increase subsistence hunting pressure on waterfowl, and increase the potential for lead shot contamination in feeding habitats. It is currently illegal to use lead shot while hunting waterfowl, although lead shot is allowed for hunting upland species. Illegal use of lead shot for hunting waterfowl, or legal use of lead shot for hunting upland species near waterfowl habitats, could contribute to the effects of lead poisoning on waterfowl populations.

Factors Outside of the North Slope

Wintering grounds and portions of migratory routes of many bird species lie in areas outside of the U.S., and regulated or non-regulated development in these areas can impact critical bird habitats. Habitat losses in non-breeding areas could be particularly significant for species of concern or species with low population numbers, such as buff-breasted sandpiper. Habitat losses may occur directly from habitat destruction due to development, or from pollution, such as exposure to agricultural pesticides that may reduce the ability of birds to reproduce or may cause direct mortality to birds. Other activities, such as commercial fishing, may also have the potential to cause changes in predator/prey relationships or damage benthic habitats that could affect some marine bird populations. Impacts related to subsistence hunting and sport hunting in wintering areas and along migratory routes can be additive to the effects of development on the North Slope. Spent lead shot that remains in waterfowl feeding habitat has been linked to lead poisoning for some waterfowl species (Franson et al. 1998). Impacts of subsistence hunting may impact species of concern such as brant, bar-tailed godwit, and threatened eiders as well as many more abundant species. Cumulative effects to birds would include habitat loss and disturbance related to activities on the migration and wintering grounds that could result in permanent or temporary displacement from preferred feeding and roosting habitats.

Global Climate Change

Much research in recent years has focused on the effects of naturally-occurring or man-induced global climate regime shifts and the potential for these shifts to cause changes in habitat structure over large areas. Although many of the forces driving global climate regime shifts may originate outside the Arctic, the impacts of global climate change are exacerbated in the Arctic (ACIA 2004). Temperatures in the Arctic have risen faster than in other areas of the world as evidenced by glacial retreat and melting of sea ice. A few bird species, such as black guillemot that feed near the ice edge, may not be able to bring food to their young as the pack ice moves further offshore.

The increasing thickness of the active layer of soil above arctic permafrost is likely to cause changes in moisture regimes and the distribution of vegetation types over much of the Arctic in coming years. Thawing of the permafrost may result in increased amounts of surface water in some areas. Areas of permafrost with substrates composed of fine-grained materials may be susceptible to drying, erosion, and desertification (ACIA 2004). Rising temperatures are likely to favor the expansion of the northern boreal forest into areas currently occupied by tundra. Global climate change may also result in an increase in shrubs at the expense of forbs and graminoid vegetation characteristic of Arctic tundra. In addition, rising seal levels resulting from increasing temperatures may further reduces the amount of tundra habitat available to nesting birds by causing coastal erosion and by inundating low-lying areas. These changes may be beneficial to some species such as those associated with boreal forest or shrub habitats, but a reduction in the amount of tundra habitat available could negatively impact tundra-nesting shorebirds and waterfowl.

Contribution of Amendment Alternatives to Cumulative Effects

Impacts to habitat from seismic surveys in the Planning Area would occur on approximately 150 (Alternative A) to 200 (alternatives B, C, and D) acres. Impacts from ice road construction would occur on another 210 acres annually, while impacts from ice pads would occur on 30 to 270 acres during the life of the project; these impacts to habitat would be short-term and would not accumulate.

Development in the Planning Area would directly and indirectly impact 790, 3,480, 4,210, and 2,810 acres of bird habitat for alternatives A through D, respectively, if oil prices average $25/bbl. Wetlands, which are important to waterfowl and shorebirds, would comprise approximately 95 percent of this habitat loss. These habitat losses could account for 3 to 14 percent of the habitat projected to be lost due to development on the North Slope during the next 50 years. Given that the area most likely to developed under the action alternatives is located north and northeast of Teshekpuk Lake, areas that support large numbers of waterfowl and shorebirds, impacts to birds could be much greater than predicted based on amount of area disturbed. As shown on maps 3-13 to 3-19, the area to the north, northeast, and east of Teshekpuk Lake and to the coastline has medium to high population densities of

several species of waterfowl, and shorebirds, including white-fronted geese, brant, and pintails. Depending on the types and locations of facilities, impacts to brant and other waterfowl could accumulate, especially where species are concentrated, and affect the long-term health of local populations. The effects to waterfowl, shorebirds, and other birds from oil and gas development would be less under the No Action Alternative and Alternative B, because all (No Action Alternative) or most (Alternative B) of this area would be closed to leasing under these alternatives. The effects would be greatest under Alternative C, since the entire area would be open to leasing. The effects from the final Preferred Alternative would be less than Alternative C, but greater than Alternative B, since some development could occur within this area.

Conclusion

Birds are not distributed evenly across the Planning Area and some areas and habitats are more important to some species than others. Areas northeast and northwest of Teshekpuk appear to be areas with high densities of nesting shorebirds, and the Goose Molting Area north of Teshekpuk Lake is extremely important for brant and other molting geese. If these areas were developed, impacts to birds could be greater than those predicted based on amount of disturbance area in the overall Planning Area.

Potential future oil and gas leasing, exploration, and development activities would be the major source of cumulative effects to birds that could occur in the Planning Area. These effects would be additive to the effects of activities that have occurred in the past on the North Slope, along migratory routes, and in wintering areas. These include all of the activities related to oil and gas development in existing fields east of the Planning Area, and potential future oil and gas leasing and development in North Slope areas west of the Planning Area. The effects of global climate change are difficult to predict, but changes in habitat structure associated with climate change would likely have a cumulative impact on bird populations.

4.7.7.9 Mammals

Terrestrial Mammals

Onshore and offshore oil and gas exploration and development in the Planning Area are the primary contributing activities in terms of cumulative effects on mammals on the North Slope. The primary effects from oil and gas exploration include habitat loss and disturbances that displace mammals from preferred habitat areas or impact their behavior. An oil spill could cause the direct harm or mortality to mammals due to its toxic effects, and also affect habitat.

Other factors that contribute to the cumulative effects on mammals on the North Slope include permitted activities such as non-oil and gas-related overland moves and development, scientific data gathering, recreation, hunting, and development. Global climate change is of concern because it may cause shifts in available habitat types, and a concurrent shift in mammal species that use these habitats. In addition, an analysis of cumulative effects to marine mammals cannot ignore effects to animals on migration and wintering areas, where impacts to marine mammals could be independent of activities on the North Slope. Because mammal populations can show substantial changes between years and even over longer periods of time, it is often difficult to determine if effects are accumulating at the population level, or merely reflect short-term shifts in population numbers.

Past Effects and Their Accumulation.

Activities Not Associated With Oil and Gas Exploration and Development. Excluding development associated with villages, military sites, rural airstrips, and hunting, non-oil and gas activities have had only a minor impact on terrestrial mammals. The amount of non-oil and gas activity on the North Slope is very low, and impacts consist primarily of short-term disturbance to individual animals. Aircraft disturbance of terrestrial mammals associated with resource-inventory survey activities (particularly by helicopter traffic) would be expected to have short-term effects on some caribou and muskox (particularly cow/calf groups), with animals being briefly displaced within about 1 mile of feeding and resting areas when aircraft pass nearby. It is unlikely that these effects persist today.

Approximately 7,000 to 11,000 mammals are killed annually on the North Slope by subsistence hunters. Based on surveys conducted in the 1980s and early 1990s (see Appendix J; Subsistence), Barrow residents killed approximately 1,800 mammals annually. An additional 200, 1,250, and 770 mammals were killed annually by residents of Atqasuk, Nuiqsut, and Anaktuvuk Pass, respectively. An additional 3,000 to 7,000 Porcupine Caribou Herd caribou are killed annually (ACIA 2004). Since mammal populations on the North Slope appear healthy and are stable or increasing in numbers (except for the Porcupine Caribou Herd, which has declined about 3.5 percent annually since 1989), hunter kill is likely replacing some of the loss of animals that would occur due to natural mortality, and effects are not accumulating.

Non-oil and gas development at former military sites and in villages has caused the loss of habitat and increased levels of disturbance. Approximately 2,500 acres have been disturbed for non-oil and gas development on the North Slope. These villages and developments are within or near important mammal use areas, including important summer, winter, and migration range for the TLH, WAH, and CAH caribou (see Maps 3-21 to 3-26). Development has led to the loss of habitat and increased disturbance effects to mammals. These effects, coupled with subsistence and non-subsistence recreational hunting pressure, have resulted in effects to caribou that persist today.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration

Loss of habitat and disturbance are the two primary factors associated with seismic activities and exploration that could affect mammals on the North Slope. Until recently, seismic testing resulted in few conflicts with caribou in Arctic Alaska (NRC 2003). Seismic surveys on the summer ranges of the CAH, TLH, and WAH caribou were conducted during winter, when the animals were not present. In a few cases, winter seismic survey areas at times overlapped with CAH, TLH, WAH, and Porcupine Herd caribou winter ranges, but impacts were probably limited to small groups of animals. It is likely that these activities briefly disturbed and displaced TLH caribou near seismic grids, exploration drill sites, and along ice roads and aircraft transportation routes. However, it is unlikely that this effect persisted after exploration was completed, and there was likely no consequential effect on the abundance or productivity of the caribou. More recently, seismic line intensity has increased as more 3-D surveys are conducted and exploration extends into the foothills of the Brooks Range and to the west of the Planning Area, areas where more wintering caribou are found.

Much of the ACP has been surveyed since the 1940s, and nearly all of the Planning Area (see Figure 4-1). Rolligons and track vehicles used during seismic exploration have left tracks on tundra habitats that are still visible today and that could make the habitat unsuitable for mammals (about 100 acres; Kevan et al 1995). Only a small portion of seismic and camp move trails are still in evidence. Use of lightweight vehicles, dispersing traffic patterns, minimizing sharp turns, and requiring surveys to be done when there is adequate snow and frost cover to protect the tundra have helped to minimize damage to vegetation used by caribou (Walker 1996).

Other sources of habitat loss include exploration sites with gravel pads, disturbed areas around these pads, exploration airstrips, and gravel exploration roads. Based on a report by the NRC (2003), in 2001, approximately 1,200 acres had been impacted by these sites in the past, and 740 acres of disturbed areas were still evident. Most of these sites were developed before 1977, thus, their effects on the vegetative landscape have persisted for decades, and are likely to persist for several more decades. As industry has shifted towards use of ice roads and pads during exploration, loss of mammal habitat has slowed greatly. Ice roads and pads have effects that could impact mammal habitat for several years, but would be unlikely to accumulate.

Oil and Gas Development and Production

Loss of mammal habitat from road and pad construction and gravel mining, and disturbance associated with development and production activities, are effects to mammals that have occurred in the past and that persist today. Peat and gravel roads, gravel pads, and gravel mines have caused the direct loss of mammal habitat, and also have led to the indirect loss of habitat from road dust and alteration of natural drainage patterns. Through 2001, over 500 acres of peat roads still showed evidence of disturbance, even though most of these roads were constructed over 30 years ago. Gravel footprints had impacted over 9,200 acres, while gravel mines had impacted another 6,360 acres

of vegetation. Of this, all but 70 acres of gravel footprint persisted in 2001, but over 4,500 acres of gravel mines were reclaimed.

Motorized traffic along about 400 miles of roads has disturbed, impeded the movement of, or displaced, caribou and other terrestrial mammals (NRC 2003). Disturbance of caribou from road traffic associated with pipelines has been shown to cause short-term displacement of caribou within about 1 mile of the road (2 ½ miles for parturient females and calves). Road traffic has delayed the successful crossing of pipelines and roads by caribou, and could have adverse energetic effects on some animals. Grizzly bears, wolves, Arctic foxes, and other mammals generally seem to cross roads more easily than caribou.

Road construction has increased access to previously undeveloped areas and has increased hunting pressure on terrestrial mammals from public and subsistence hunters in more remote regions of Alaska. Hunting pressure and harvests have increased for many wildlife species near the TAPS since its construction but have not produced adverse population effects (TAPSO 2001).

Oil development in the Prudhoe Bay-Kuparuk River Unit area has caused displacement of CAH caribou from a portion of the calving range, with a shift in calving distribution away from the oil fields (Nellemann and Cameron 1996; Lawhead 1997; Cameron et al. 2002; NRC 2003). The reduction in calving habitat use near oil development facilities could eventually limit the growth of the Arctic caribou herds within their present ranges and prevent the herds from reaching the maximum population size that they could achieve without the presence of development. It is possible that such an effect would not be apparent, because natural changes in the distribution and productivity of the herds would be likely to influence the abundance and growth of caribou populations over and above the effect of reduced habitat use caused by cumulative oil development. For example, the CAH caribou population estimate decreased from 23,000 in 1992 to 18,100 animals in 1995, and then rose to 31,857 caribou in 2002. However, recent information on the body weights of CAH cow caribou that calve west of the Sagavanirktok River, compared with CAH cow caribou calving east of the river, and suggested that disturbance displacement of cow caribou may be affecting CAH caribou productivity (Cameron 1994; Nellemann and Cameron 1996; Cameron et al. 2002). On the other hand, differences in densities and movements between segments of the CAH caribou on the oil fields and east of the fields may have contributed to the decline (Cronin et al. 1997). The NRC (2003) suggested that the combined effects of industrial activity and infrastructure, and the stress imposed by insects, might have contributed to the reduction in size of the herd seen from 1992 through 1995. Cronin et al. (2000) argued that population-level impacts from oil field development have not occurred for this herd. However, comparing the higher growth rate of the TLH to the growth rate of the CAH, Griffith et al. (2002) suggested that the CAH might have been influenced by development infrastructure after 1987.

The alteration of over 8,000 acres of tundra habitat in the Prudhoe Bay area has not had any apparent effect on the distribution and abundance of other terrestrial mammals, with the possible exception of Arctic foxes, which apparently have increased in numbers near the oil fields. Muskox have continued to expand their range westward across the North Slope from an introduced population in the Arctic National Wildlife Refuge. There have been no apparent effects on wolves or other terrestrial mammal populations associated with this development.

Spills

The NRC's Committee on Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope found that most spills to date have had only local effects, and that there is no evidence that effects of spills have accumulated (NRC 2003).

Summary of Past Effects and Their Accumulation. Approximately 2,500 acres of habitat have been directly impacted by non-oil and gas development that continue to persist. Oil and gas activities have caused an additional habitat loss of 13,000 acres, and indirectly impacted approximately 21,000 acres of habitat that persist today. Since most of these impacts are associated with ongoing non-oil and gas residential and commercial development, and oil and gas activities, these impacts to habitat are additive to future impacts and would be likely to persist for several decades or more, in the absence of an active reclamation program. Oil and gas development has altered the distribution of female caribou during the summer season and interfered with caribou movements between inland

feeding areas and coastal insect-relief areas. Female caribou may also experience lower parturition rates when in close proximity to oil field development. It has also been suggested that declines in CAH caribou productivity in the early 1990s may have been the result of additive effects of oil field development and high insect activity, although populations of TLH, CAH, and WAH caribou have steadily increased since the mid-1970s. Thus, disturbance of caribou due oil field development may adversely affect caribou, but these effects are not readily apparent based on population trends. Other mammal populations (e.g., fox and grizzly bear) have been little affected, or may even have benefited from development on the North Slope. Subsistence and recreational hunting pressure has likely increased from historic levels due to increases in human populations and better access to the North Slope. Still, based on subsistence harvest surveys, subsistence harvest of mammals was relatively stable during the 1980s and early 1990s. Based on population trends of game mammals on the North Slope, hunting does not appear to be adversely affecting mammal populations.

Future Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development. Non-oil and gas activities, including archaeological and paleontological digs, camps associated with scientific studies, recreational use, overland moves by transport vehicles, and use of OHVs such as four-wheel vehicles and snowmachines, would continue to cause the loss of minor amounts of mammal habitat and disturb mammals. In most cases, loss of habitat would be temporary, lasting only a few years. DEW-Line and other military sites, villages, airstrips, and other non-oil and gas infrastructure are likely to persist into the indefinite future, and for villages, likely increase in size, causing the loss of additional habitat.

Although not part of the development scenario for the Planning Area, it is reasonably foreseeable that the State of Alaska would build a new highway connecting the village of Nuiqsut and the National Petroleum Reserve – Alaska to the Dalton Highway. Assuming a length of 18 miles (to connect the Spine Road with the proposed bridge on the Colville River) and assuming the same impacts for construction as for other gravel roads and pads, such a road would bury about 80 acres of habitat and potentially alter the vegetation on up to several hundred more acres as a consequence of dust or gravel spray and changes in the moisture regime caused by changes in natural drainage patterns. Another proposal is to build a road from TAPS to the Planning Area. This road could be 100 or more miles in length, and would directly impact 420 acres or morel. An additional 80 acres could be impacted due to development of gravel mines. Erosion associated with soil disturbance, and spills from equipment and construction activities, could impact mammal habitat and caribou and other large-mammal movements. The road may increase the number of visitors and hunters to the Planning Area, resulting in increased disturbance and hunting pressure to caribou. In addition, if the road is opened to the public, it would increase the number of visitors, and hunters, to the Planning Area. Increased disturbance and hunting pressure could have adverse, and accumulating, impacts to mammal populations.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration

About 1,300 miles of seismic trails are added each year. Based on projections developed for the Planning Area, this activity could impact up to 100 acres of habitat annually that would still show moderate to high levels of disturbance a decade later. However, based on recent studies of the use of newer seismic technologies, it is likely that impacts to mammal habitat that persist for a decade or more would be substantially less than this estimate (Jorgenson et al. 2003).

Other sources of habitat loss include exploration sites with gravel pads, disturbed areas around these pads, exploration airstrips, and gravel exploration roads. These have been replaced in recent years by ice roads, airstrips, and drilling pads to reduce the costs and environmental effects of gravel construction (Johnson and Collins 1980, Hazen 1997). As a result, only a small amount of habitat is likely to be affected by long-term by exploration sites and facilities.

Oil and Gas Development and Production. Development activities that could contribute to cumulative effects to mammal habitat on the North Slope include oil development, including the Planning Area and northwestern and southern portions of the National Petroleum Reserve – Alaska; federal and state offshore oil development (through the construction of supporting onshore infrastructure); state onshore oil development; oil transportation; and road construction. All of these activities involve construction of infrastructure that would destroy habitat within the immediate footprint of the project and indirectly affect habitat through dust, flooding, changes in natural drainage patterns, snow drifting, increased water and air pollution, and oil and chemical spills.

Although the increase in the amount of area disturbed by oil and gas development has slowed dramatically in recent years, it is estimated that an additional 3,500 acres would be covered by gravel, and 500 acres impacted by gravel mines, in the next 25 years, much of this in the Planning Area. Approximately 9,200 acres would be indirectly affected by dust, changes in hydrology, and thermokarst. An additional 4,000 acres of mammal habitat could be impacted by oil and gas activities between 2030 and 2055; another 9,200 acres would be indirectly impacted by development.

These impacts are additive to the impacts to habitat that have accumulated in the past and persist today, but in the context of the ACP and North Slope, these cumulative impacts would be small. Based on direct (21,000 acres) and indirect (36,000 acres) that could still persist in 2050, direct and indirect impacts to habitat would occur on 0.43 percent of the ACP and 0.10 percent of the North Slope. These estimates do not take into account the quality of habitat that would be impacted on the North Slope. It is likely that the focus of future oil and gas exploration and development would be within the Barrow Arch, which is located in the ACP. Areas to the north and east of Teshekpuk Lake provide important calving, post-calving, and insect-relief habitat for TLH caribou (see maps 3-24 to 3-26). Thus, impacts to caribou and other mammals from development in this area would likely be much greater than if development occurred in areas that were little used by caribou.

Disturbance

Cumulative oil and gas development on the North Slope could result in a long-term displacement and/or functional loss of habitat for CAH, TLH, and WAH caribou. Future State of Alaska lease sales on the North Slope between the National Petroleum Reserve – Alaska and the Arctic National Wildlife Refuge, and in the foothills of the Brooks Range, would increase the amount of activity associated with oil exploration and development within the CAH caribou range. Future offshore leases in the Beaufort Sea could expose TLH and CAH caribou to additional activities related to oil and gas development (through onshore facilities to support offshore leases). Future lease sales in the National Petroleum Reserve – Alaska could expose a large number of the TLH caribou to exploration and development activities on their summer and winter grounds, and during migration. Animals from the WAH caribou would also be exposed to development activities in their summer range.

Development of onshore oil and gas resources in the Northwest National Petroleum Reserve – Alaska could result in construction of an additional pipeline that would pass through the Planning Area. Construction of a pipeline from the Northwest National Petroleum Reserve – Alaska east to the Kuparuk River Unit, or a southern pipeline route connecting to TAPS Pump Station 2, would temporarily disrupt movements of CAH and TLH caribou. Movements of TLH and WAH caribou from wintering habitat to calving grounds could be temporarily disrupted. However, pipelines associated with sales under this amendment would not have associated roads, and should therefore have minimal effects on caribou movements once construction was completed. State of Alaska oil and gas leasing offshore and adjacent to the CAH and TLH caribou ranges, as well as federal OCS leases in Harrison Bay west to Barrow, might include offshore pipelines that would come onshore within the TLH caribou range and connect with the facilities at Kuparuk. Potential offshore oil development adjacent to the TLH and CAH caribou ranges could result in increased surface vehicle traffic, which would disturb caribou along transportation corridors that would connect offshore oil discoveries with the existing infrastructure. Development also might increase disturbance of caribou by ground vehicles and air traffic in insect-relief areas along the coast, and perhaps reduce the seasonal use of coastal areas by cows and calves.

The reduction in calving habitat use near oil development facilities could eventually limit the growth of the Arctic caribou herds within their present ranges and prevent the herds from reaching the maximum population size that

they could achieve without the presence of development. It is possible that such an effect would not be apparent, because natural changes in the distribution and productivity of the herds would be likely to influence the abundance and growth of caribou populations over and above the effect of reduced habitat use caused by cumulative oil development. The final Preferred Alternative and alternatives B and C would permit activities within the TLH caribou calving grounds; therefore, calving TLH caribou could be exposed to oil and gas development facilities and activities at a time of year when they are most sensitive to disturbance, possibly resulting in reduced calving success.

Oil development within the Planning Area could expose summering WAH caribou to noise and disturbance impacts. If development occurred in the southern part of the Planning Area, some WAH animals could be exposed to development activities during the insect season, and normal movement patterns could be disrupted. This herd is not currently exposed to oil and gas development activities in any other part of their primary range; therefore, cumulative impacts to the WAH caribou would be minor, although development in the Northwest National Petroleum Reserve – Alaska could increase these impacts. These effects on TLH, CAH, and WAH caribou would accumulate with other past effects on these herds, although the likely magnitude of these effects is difficult to ascertain, especially given the increase in herd sizes that have occurred in recent years in spite of oil and gas development on the North Slope.

The alteration of over 8,000 acres of tundra habitat in the Prudhoe Bay area has not had any apparent effect on the distribution and abundance of other terrestrial mammals, with the possible exception of Arctic foxes, which apparently have increased in numbers near the oil fields. Muskox have continued to expand their range westward across the North Slope from an introduced population in the Arctic National Wildlife Refuge. There have been no apparent effects on wolves or other terrestrial mammal populations associated with this development.

The increase in the number of development facilities on the North Slope would be expected to increase the number of negative interactions between humans and grizzly bears, and to result in the loss of bears because of their attraction to human refuse. These interactions could eventually result in a decline in grizzly bear abundance near development areas. It is also expected that cumulative oil development on the North Slope would result in an increase in the abundance of Arctic foxes near development areas, which could affect tundra-nesting birds and could also pose a health hazard to humans through the spread of rabies among the growing fox population. Efforts to minimize the amount of refuse available to mammals should lead to a long-term decline in fox and other mammal populations near oil fields.

Spills

The oil industry is required to have oil spill response and clean-up capabilities, and small spills on lands or waters in the Planning Area or in existing or future North Slope oil fields are expected to be contained and cleaned up before substantial mammal and habitat loss can occur. In addition to mortality through direct contact with oil, some mortality could result through ingestion of contaminants in food and water, from the cumulative effects of the numerous small spills expected from the operation of any oil field.

The spills associated with reasonably foreseeable future projects could affect terrestrial mammals on the North Slope. Cumulative effects would depend on the number, size, location, and timing of spills, the type and effectiveness of the oil spill response, and the species and population of terrestrial mammals exposed to the spill. Potential oil spills from both offshore and onshore oil activities associated with federal and state leases would be likely to have a small effect on terrestrial mammals because comparatively low numbers of animals would be expected to be disturbed or contaminated, or to ingest contaminated food sources and die as a result. Spills would have mostly subiethal effects on terrestrial mammals and would impact only a very minor percentage of the available habitat. The greatest potential for impact to terrestrial mammals would be through disturbance impacts during response, cleanup, and rehabilitation.

Oil produced as a result of development in the Planning Area would contribute to less than 13 percent of future spills from TAPS, but would increase the number of onshore oil spills and would likely impact tundra systems in some instances. The amount of oil produced on the North Slope under the reasonably foreseeable future scenario is

likely to continue to trend downward. As oil production slows, coupled with improvement in spill prevention and control technologies and training, the potential for effects to mammals should decline over time.

Abandonment

Abandoned gravel pads and roads could provide some benefits as insect-relief sites for caribou, and provide special habitat for burrowing species, such as Arctic ground squirrels and other mammals. The ultimate fate of the gravel pads and roads would not be known until closer to end of the production pad life. Permitting agencies could require that gravel be removed, in part or total, and the tundra revegetated. If other uses are determined by the permitting agencies to be preferable, the agencies could allow the permittee to leave the gravel pads in place, either revegetated or not revegetated. Removed gravel either would be disposed of or reused for another development.

Abandonment of airstrips could occur in conjunction with abandonment of pads. The gravel airstrips would be managed in a similar manner, depending on the decisions made by land managers and permitting agencies at the time of abandonment. Gravel airstrips would either be removed and the tundra revegetated, revegetated but otherwise left in place, or left in place and maintained for public use.

Summer road and air traffic generated by abandonment and rehabilitation activities could cause disturbance, displacement, and mortality to caribou and other mammals that would be similar to, and at the same levels as that caused by traffic during construction and operations. If pads, roads, and airstrips were revegetated without removing the gravel, the habitat would likely not return to its current utility. If gravel was removed, habitat similar to that currently existing in the area could be created and used by mammals, though the precise mix of habitat types would likely not be the same as what prevailed at the time of disturbance. The effects of habitat loss would accumulate, as described above, to the extent that habitats were not, or could not be, restored to their original condition.

Global Climate Change

Predicting the effects of climate change on terrestrial mammals is difficult because of the complexity of tundra ecosystems. It is predicted that an increase in abundance of deciduous shrubs, especially birch (less favorable caribou forage), and a decline in the abundance of grasses-sedges such as tussock cottongrass (an especially important food of calving caribou), would occur if temperatures in the Arctic were to increase, thereby reducing the amount of available forage for caribou on the North Slope (Anderson and Weller 1996). Over decades, warming temperatures could result in the invasion of tundra habitat by taiga woody plants (taiga forests), a less favorable habitat for tundra mammals, thereby potentially affecting their populations. Warmer temperatures could also result in increased insect abundance and periods of activity (NRC 2003). Changes in weather patterns could alter caribou movements and distribution. Calving grounds could shift in response to changes in vegetation. Insect-relief habitat could become increasingly important, because of increased insect abundance and activity. Coastal erosion and the inundation of low-lying areas along the coast due to increases in sea level may alter the availability and extent of insect-relief areas and may cause shifts in the usage of particular areas. Over time, areas that are currently closed to leasing could become less important to caribou, while areas that are open to leasing could become more important.

The ACIA (2004) noted that the Porcupine Caribou Herd, which is the largest migratory herd of mammals shared between the U.S. and Canada, has declined about 3.5 percent annually since 1989, possibly due to climatic effects. However, during this same period, the WAH, CAH, and TLH caribou populations have trended upward. A warming trend would stimulate faster plant growth in the spring, which should result in higher calf growth rate and allow cows to replenish fat reserves sooner. However, warmer springs have caused the Porcupine River to thaw earlier in spring. Historically, the herd crossed the river while still frozen to access calving grounds in the Arctic National Wildlife Refuge. With the river thawing earlier, cows that calve early must try cross the flowing river with their calves, causing thousands of calves to wash down the river and die (ACIA 2004).

Contribution of Amendment Alternatives to Cumulative Effects

Long-term impacts to habitat from seismic surveys in the Planning Area would occur on approximately 150 (Alternative A) to 200 (alternatives B, C, and D) acres. Impacts from ice road construction would occur on another 210 acres annually, while impacts from ice pads would occur on 30 to 270 acres during the life of the project; these impacts to habitat would be short-term and would not accumulate.

Development in the Planning Area would directly and indirectly impact 790, 3,480, 4,210, and 2,810 acres of mammal habitat for Alternatives A through D, respectively, if oil prices average $25/bbl. These habitat losses would account for 3 to 14 percent of the habitat projected to be lost due to development on the North Slope during the next 50 years. Given that the area most likely to developed under the action alternatives is located north and northeast of Teshekpuk Lake, areas that provide critical habitat for TLH caribou and other mammals, impacts to caribou, other mammals, and their habitats could be much greater than predicted based on amount of area disturbed. As shown on maps 3-24 to 3-26, the area to the north, northeast, and east of Teshekpuk Lake and to the coastline provides important caribou calving and insect-relief habitat. Because of its importance, Lease Stipulations K-9 and K-10 were developed for the final Preferred Alternative to provide special NSO protection to caribou habitat. Lease Stipulation K-11 would limit development in the Goose Molting Area to the north of the lake. Still, caribou and other wildlife would be exposed to oil and gas disturbance in their summer, and potentially winter, range. Depending on the types and locations of facilities, impacts to caribou and other mammals could accumulate, especially where species are concentrated, and could affect the long-term health of the local population. The effects to caribou and other mammals from oil and gas development would be less under the No Action Alternative and Alternative B, because all (No Action Alternative) or most (Alternative B) of this area would be closed to leasing under these alternatives. The effects would be greatest under Alternative C, since the entire area would be open to leasing. The effects from the final Preferred Alternative would be less than Alternative C, but greater than Alternative B, since some development could occur within this area. Offshore development associated with leases in the Beaufort Sea could impact small areas along the coast for staging and storage of materials, but is unlikely to impact large areas of habitat.

Conclusion

Cumulative oil development in the Prudhoe Bay-Kuparuk area encompasses more than 500 square miles, and hundreds of miles of gravel roads cross a large portion of the CAH calving range. More than 17,000 acres of habitat have been destroyed or altered where roads, gravel pads, gravel quarries, pipelines, pump stations, and other facilities are located on the Arctic Slope (USDOI BLM 1998b), and an additional 1,500 to 2,000 acres are expected to be directly affected by reasonably foreseeable development in the Northeast National Petroleum Reserve – Alaska. An additional 6,000 or more acres on the North Slope could be affected by construction of infrastructure associated with reasonably foreseeable future development on the North Slope.

Cumulative effects on caribou distribution and abundance are likely to be long term, lasting as long as the life of the oil fields. Any reduction in calving and summer habitat use by cows and calves as a result of future onshore leasing would represent a functional loss of habitat that accumulates and could result in long-term effects on the caribou herds' productivity and abundance. These impacts would likely be greatest under Alternative C and lowest under the No Action Alternative. However, this potential effect might not be measurable, given the great natural variability in the caribou population productivity. The effects of oil and gas activities in the National Petroleum Reserve – Alaska would be greatest on those herds that use the Planning Area (large numbers of TLH and smaller numbers of WAH caribou). If global climate change over the next several decades were to result in widespread changes in vegetation and insect abundance, effects to terrestrial mammals could be exacerbated and extend beyond the life of the oil fields. If these cumulative effects were to result in reductions in caribou populations, there could also be a reduction in the abundance of predators such as wolves, bears, and wolverines.

Marine Mammals

This section discusses the cumulative effects on ringed, bearded, and spotted seals, walruses, polar bears, and beluga and gray whales from oil and gas leasing and development activities. Current and proposed development

activities could also affect other marine mammals whose ranges are located within oil tanker routes in the Bering Sea and Gulf of Alaska; the potential effects of development on marine mammal populations located along these tanker routes are discussed elsewhere (USDOI BLM 1998b). In addition to oil and gas leasing and development, other potential sources of effects to marine mammals in the Beaufort and Chukchi seas include North Slope fisheries activities, subsistence hunting, global contaminants, and the potential effects of global climate change.

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development. Commercial fisheries compete with seals and beluga whales for prey species, and seals and whales have suffered mortality from entanglement in fishing nets. In addition, marine mammals thought to be raiding fishing nets have been shot by fishermen. Marine mammals have also been displaced from preferred feeding habitats by noise and visual disturbances caused by fishing activities.

Commercial fisheries on the North Slope are generally small operations that have likely affected only a small number of marine mammals. The extent of the impacts would depend on the level that fishing industry activities increased and their effects on the availability of prey species for marine mammals.

Before the Marine Mammal Protection Act became law in 1972, active sport hunting for polar bears off western and northern Alaska reduced the population (Amstrup et al. 1986). Since then, marine mammals can be hunted only for subsistence and handicraft purposes by Alaska Natives, and, unless populations are declared depleted, there are no federally-imposed limits on this type of hunting. Since 1988, hunting of polar bears from the southern Beaufort Sea stock has been controlled by a conservation agreement between the Iñupiat of northern Alaska and the Inuvialuit of the western Canadian Arctic, who hunt a shared population (Nageak et al. 1991). The number of animals taken each year is well documented; from 1988 to 1995, the average annual take of 58.8 bears was well below the estimated "potential biological removal level" of 73 (USDOI USFWS 1998) and therefore was considered safe.

Little is known about the number of ringed seals harvested, but they are an important subsistence resource to indigenous people throughout the Arctic (Smith et al. 1991). Alaska Native dependence on, and interest in, hunting marine mammals is influenced by many factors, including cultural involvement, employment, community wealth, logistics, and ice and weather conditions. The number of animals killed by hunters can be expected to vary accordingly. However, current legal restrictions should prevent harm to populations of these animals if they are properly enforced.

Approximately 7,000 to 11,000 mammals are killed annually on the North Slope by subsistence hunters. Based on information provided in Appendix J, Subsistence, approximately 5 whales, 1,130 seals, 20 walruses, and 15 polar bears are taken annually by Barrow subsistence hunters. Residents of Atqasuk harvest only a few seals annually. Nuiqsut hunters occasionally harvest beluga whales, polar bears, and walruses; approximately 50 seals are taken annually. Marine mammals, including bowhead whales, comprise about 32 percent of the subsistence harvest for Nuiqsut. Subsistence harvest surveys for Anaktuvuk Pass have showed that no marine mammals were harvested by residents during survey years from 1990 to 1995. Since marine mammal populations on the North Slope appear healthy, and are stable or increasing in numbers, hunter kill is likely replacing some of the loss of animals that would occur due to natural mortality, and effects are not accumulating.

Marine mammals are also killed in other ways. At least one ringed seal pup has been killed by a bulldozer that was clearing seismic lines on shore-fast ice of the Beaufort Sea. A polar bear died on the North Slope apparently after eating a container of dye used to mark temporary airstrips. It is not uncommon for residents to shoot polar bears in defense of life and property. Regulatory agencies and the oil and gas industry have made serious efforts to minimize interactions with polar bears, both to increase human safety and to safeguard the bears (Truett 1993).

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration

Seismic activities that occurred on offshore sea ice during exploratory operations in the Beaufort and Chukchi seas may have affected ringed seals. Seismic activities are conducted in a relatively small area; therefore, exploratory activities likely affected a different group of seals each year. Consequently, only a relatively small portion of the population would have been affected during any one year. During seismic operations, some seals could have been displaced from lairs within 500 feet of the seismic lines. These seals likely used alternate breathing holes and returned to lairs after the seismic equipment had passed through the area. A few pups could have been killed during seismic activities, and a small number of maternity lairs could have been abandoned or destroyed, causing the loss of a few pups. Since seismic activities would target different areas each year, ringed seal losses in a particular area would likely recover within a year or two and effects would be unlikely to accumulate.

Oil and Gas Development and Production

Gravel placement for construction of drilling and production islands, offshore platforms, drilling ships, and installation of buried pipelines are sources of habitat alteration. Gravel placement for island construction has covered relatively small areas of benthic habitat, which would be permanently lost. Installation of subsea pipelines may cause short-term effects to benthic habitats that would likely persist for less than 1 year. In general, marine mammals have large territories and are not dependant on local food sources, therefore the effects of habitat loss to marine mammals due to offshore oil and gas leasing and production probably have not accumulated.

Gravel islands and platforms could have localized effects on ice movements and formation around these structures, but would not be expected to affect the distribution of marine mammals. Naturally occurring variations in ice formation and movement would have a much greater effect on marine mammal distribution than localized changes near gravel islands and platforms. Noise and construction or other activities near gravel islands and platforms are more likely to caused disturbances that would affect a small number of marine mammals near these sites.

Effects of Noise and Disturbance

Noise from fixed-wing and helicopter aircraft traffic displaces marine mammals from preferred habitats, but animals likely return to these habitats shortly after the passage of the aircraft. Some animals would be unaffected by aircraft traffic or become habituated to this activity. Disturbance from vessel traffic could elicit greater responses from marine mammals because the duration of the disturbance would be greater than that caused by aircraft.

Beluga and gray whales could be affected by noise associated with the construction of gravel islands and drilling activities on gravel islands. However, since the migration corridor for most beluga and gray whales is far offshore, few whales have likely been affected. Much of this noise occurs during the winter and would not affect whales in their wintering areas. Some whales migrating close to gravel islands may have been deflected by noise disturbances (Richardson et al. 1995; Richardson and Williams 2003; NRC 2003). Noise associated with vessel traffic could have a greater effect on migrating whales than noise from other industrial sources, and noise associated with seismic exploration could have a greater effect on migrating whales than that of other types of vessel traffic. Construction of subsea pipelines from gravel islands to the mainland would occur during the winter when beluga and gray whales are on wintering grounds. If additional staging areas along the Northeast National Petroleum Reserve – Alaska coast led to increased offshore activities, the potential for marine mammals to be impacted by noise or other activities would likely increase. Staging areas for the Northeast Petroleum Reserve – Alaska may also increase potential for new offshore developments that could increase the amount of noise and other activities that could impact marine mammals.

Studies of the potential effects of disturbance on shore-fast ice on pupping ringed seals have showed that there was probably some displacement of ringed seals from areas close to artificial islands in the central Beaufort Sea (Frost and Lowry 1988), and that there was a higher abandonment rate of seal breathing holes close to seismic survey lines (Kelly et al. 1988). Noise likely affected haul out behavior of pinnipeds but no quantitative data are available. From data collected in the central Beaufort Sea from 1985 to 1987, Frost et al.

(1988) concluded that there were no broad-scale effects of industrial activity on ringed seals that could be measured by aerial surveys, but they also noted that there was little offshore activity during those years. Subsequent industry-funded monitoring studies for the Northstar and Liberty projects suggested minor effects on ringed seals from ice road construction and seismic exploration (Harris et al. 2001; Richardson and Williams 2000).

For most of the year, polar bears are not very sensitive to noise or other human disturbances (Amstrup 1993; Richardson et al. 1995). However, pregnant females and those with newborn cubs in maternity dens both on land and on sea ice are sensitive to noise and vehicular traffic (Amstrup and Gardner 1994). Seismic exploration has disturbed a bear in a maternity den (USDOI USFWS 1986). Current regulations require industry to avoid polar bear dens as much as possible (USDOI USFWS 1995b).

Oil Spills

The NRC's Committee on Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope (2003) found that most spills to date have had only local effects, and that there is no evidence that effects of spills have accumulated .

Effects of Hazardous Material

Solid and liquid hazardous materials associated with Department of Defense and oil industry activities have been discarded or dumped at various locations on the North Slope, including the National Petroleum Reserve – Alaska. Many of these sites have been cleaned up, but low levels of hydrocarbons and pesticides remain at some sites. These localized sites probably do not represent a substantial threat to marine mammal populations, but effects likely still persist.

Summary of Past Effects and Their Accumulation. Industrial activity in marine waters of the Beaufort Sea has been limited and sporadic and has likely not caused substantial cumulative effects on seals or polar bears. However, noise and other disturbances may have displaced whales from preferred habitats in the past, although these effects are difficult to quantify and to determine if they accumulate.

Future Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development. Commercial fisheries would continue to compete with seals and beluga whales for prey species, and seals and whales would continue to suffer mortality from entanglement in fishing nets. In addition, marine mammals thought to be raiding fishing nets may be shot by fishermen. Marine mammals may also be displaced from preferred feeding habitats by noise and visual disturbances caused by fishing activities.

Commercial fisheries on the North Slope are generally small operations that are likely to affect only a small number of marine mammals. The commercial fishing industry in the northern Bering Sea, which is growing in size, could impact North Slope seals, walruses, and beluga whales wintering in this area. The extent of the impacts would depend on the level that fishing industry activities increased and their effects on the availability of prey species for these marine mammals. Prey species of seals and beluga whales, such as fish, could be directly impacted by the fishing industry, while benthic invertebrates that serve as prey for walruses could be indirectly impacted during trawling operations. Increased commercial fishing activities could also increase the potential for direct morality of marine mammals due to shooting, or displacement from preferred feeding habitats as a result of disturbance.

The Marine Mammal Protection Act allows the secretary of commerce to permit industrial operations (including oil and gas exploration and development) to take small numbers of marine mammals, provided that doing so has a negligible effect on the species and will not reduce the availability of the species for subsistence use by Alaska Natives. Regulations governing the permits identify permissible methods, means to minimize harm, and requirements for monitoring and reporting. The permits have been used to minimize the effects of on-ice activities on pupping ringed seals, to require planning and personnel training that minimize conflicts with polar bears, and to

provide buffer zones around known polar bear maternal den sites. Annual surveys are conducted of subsistence resources to monitor population trends. If species populations are monitored and carefully managed, effects to marine mammal populations should not accumulate.

Oil and Gas Exploration and Development Activities

Seismic Activities and Exploration

Seismic activities are conducted in a relatively small area; therefore, exploratory activities likely affect only a small group of seals and other marine mammals each year. Since seismic activities would target different areas each year, seal and other marine mammal losses in a particular area would likely recover within a year or two and effects would be unlikely to accumulate.

Oil and Gas Development and Production

No formal projections have been made of how likely effects on ringed seals or polar bears from future oil and gas activities are to accumulate with effects of other human activities. Future activity would occur in the Beaufort Sea from Barrow to Flaxman Island, and possibly to the Canadian border. Activity would occur mostly near shore, adjacent to onshore oil reserves, and development would entail methods and structures similar to those currently in use (gravel islands or bottom-founded structures, horizontal drilling, buried pipelines, and an emphasis on working during winter).

Full-scale industrialization of near-shore areas would most likely result in at least partial displacement of ringed seals. The frequency with which polar bears come into contact with people and structures is undoubtedly a function of the amount of activity in their habitats. Even with the best possible mitigation measures in place, it is certain that some bears would be harassed or killed. More human activity along the coast and near the shore could reduce the suitability of some areas for use by denning female bears. This effect is likely to be greatest east of the Canning River, especially within the 1002 Area of the Arctic National Wildlife Refuge, where the highest concentration of on-land dens is found (Amstrup 1993, Amstrup and Gardner 1994). Efforts to identify areas where polar bears are most likely to den in the eastern part of the North Slope (Durner et al. 2001), should improve the ability of regulators and industry to reduce disturbance of denned bears.

Oil Spills

An offshore spill would have a greater potential to affect marine mammal species than an onshore spill, although an onshore spill that spread to coastal habitats could affect small numbers of seals and polar bears. An offshore spill could affect beluga whales, gray whales, seals, walruses, and polar bears, particularly at the edge of the shorefast ice, which is an important habitat for marine mammals. The potential impacts to marine mammals from an offshore oil spill would depend on the location and amount of oil spilled, and the time of year. An offshore spill during the open-water season could have the potential to spread to a large area by the action of wind and currents, and could impact more marine mammals than a localized spill from an onshore source near the coast. A winter spill could affect small numbers of adult ringed seals and their pups. The effects of a winter spill could extend into the summer season if oil spill clean-up operations of a winter spill were not adequate to remove the majority of the spilled oil. Oil spilled during periods of broken ice is difficult to clean up and could persist for longer periods in the environment. In general, the likelihood of an oil spill is low, and marine mammal populations affected by an oil spill would likely recover within one generation. However, increased development of offshore leases, coupled with exploration and development in the National Petroleum Reserve – Alaska and ongoing development at Alpine, Northstar, Prudhoe Bay and Point Thomson, increases the risks of oil spills that could impact marine mammals in the area.

The potential for increased dependence on terrestrial habitats by polar bears, combined with increased human development from multiple lease sales and subsequent exploration and development within the National Petroleum Reserve – Alaska and ongoing development at Alpine, Northstar, Prudhoe Bay, and Point Thompson, increases risks to polar bears from oil spills. Increased encounters with humans and spilled oil or other contaminants could increase cumulative effects to the polar bear population.

Global Climate Change

Studies in recent years have indicated a general global climate change trend that has caused a reduction in the extent and thickness of the total Arctic sea ice coverage and could potentially affect food chains and trophic levels. Continued reduction in sea ice coverage could affect the distribution and abundance of seals, walruses, and polar bears in the Arctic (ACIA 2004). The potential effects of these changes on marine mammal populations are unclear, but there is speculation that a reduction in the extent of Arctic sea ice coverage would cause drastic reductions in seal, walrus, and polar bear populations. Another hypothesis is that a reduction in sea ice coverage would create greater areas of ice edge, which is productive habitat for seals and polar bears.

In the last decade, the numbers of polar bears occurring along coastal areas of the Beaufort Sea have been increasing (Stirling and Andriashek 1992, Amstrup and Gardner 1994, Amstrup 2000). The reason for the increase in numbers of polar bears is unknown but could be related to ice conditions. The USFWS (Schliebe et al. in prep) recently compared the distance of the ice edge from shore (during fall months) with the numbers of polar bears observed on land. A significant correlation was found: as distance to the ice edge increased, so did the numbers of bears observed on land. The potential for continued reduction in ice cover from global climate change could result in greater numbers of polar bears occurring along the coastline for protracted periods of time, thereby also increasing potential conflicts with humans.

Other studies suggest that global climate change could be adversely impacting polar bear and seals. Stirling et al. (1999) documented decreased body condition and reproductive performance in polar bears in the western Hudson Bay that correlated with a trend toward earlier breakup of sea ice in recent years. The earlier breakup gives bears a shorter feeding season. They are leaner when they come ashore, and they must fast longer. Many ringed seals give birth to and care for their pups on stable shore-fast ice, and changes in the extent and stability or the timing of breakup of the ice could reduce productivity (Smith and Harwood 2001). Because of the close predator-prey relationship between polar bears and ringed seals, decreases in ringed seal abundance can be expected to cause declines in polar bear populations (Stirling and Oritsland 1995).

Contribution of Amendment Alternatives to Cumulative Effects

Impacts to marine mammals from development in the Planning Area would generally be similar under the four proposed alternatives. The increased development scenarios of alternatives B and C, and the final Preferred Alternative, would contribute additional barge and aircraft traffic impacts and would require a greater number of coastal staging areas than the development scenario under the No Action Alternative. If additional staging areas along the Northeast National Petroleum Reserve – Alaska coast led to increased offshore exploration and development activities, the potential for cumulative impacts to marine mammals by noise or other activities would increase. The potential for a spill would be expected to increase with increasing levels of exploration and development. Thus, risks to marine mammals from a spill would be greatest under Alternative C, and least under the No Action Alternative.

Conclusion

In addition to noise and disturbance from existing oil development, seals, walruses, polar bears, and beluga and gray whales could be affected by future offshore development in the Beaufort and Chukchi seas. In addition, marine mammals wintering in the northern Bering Sea could be affected by disturbance from commercial fishing activities. Subsistence hunting of marine mammals by Alaska Natives is not likely to affect marine mammals at the population level. Disturbance could result in temporary displacement from preferred feeding habitats, and some animals could be shot by fishermen. An oil spill could affect marine mammals in offshore or coastal areas, with the impacts to marine mammals depending on the location and amount of oil spilled and the time of year. The effects of future habitat alteration associated with gravel island construction, platforms or other structures related to oil development would likely be minor. The presence of small amounts of hazardous materials, including hydrocarbons and insecticides, would likely have minor effects on marine mammals. The effects of global climate change on marine mammals are unclear. While a reduction in the extent of Arctic ice coverage would likely have a

dramatic negative impact on ice-dependent seal and polar bear populations, an increase in the amount of sea ice edge resulting from global climate change may be beneficial. North Slope fisheries are small and likely have only a minor impact on marine mammal populations.

4.7.7.10 Threatened and Endangered Species

Bowhead Whale

Past Effects and Their Accumulation

The activities most likely to affect bowhead whales are subsistence hunting, marine seismic exploration, exploratory drilling, ship and aircraft traffic, discharges into the water, dredging and island construction, and production drilling. To date, there have been documented effects of industrial noise. The bowhead whale population has been growing steadily for several decades, however, despite oil and gas activities occurring in the Beaufort Sea and throughout the bowhead whale's range.

Activities Not Associated With Oil and Gas Exploration and Development. Bowhead whales, caribou, and fish are the main subsistence resources for Barrow, Nuiqsut, and Atqasuk, although subsistence resource harvests differ between communities. Bowhead whale hunting, which requires a great deal of cooperation and year-round preparation, is the impetus and focus of the Iñupiat sociocultural system. The bowhead whale is the preferred meat and the subsistence resource of primary importance, because it provides a unique and powerful cultural basis for sharing and community cooperation (see Appendix J; Stoker 1983 *in* ACI and SRBA 1984). Barrow is the only community within the area that harvests whales in both the spring and the fall, while Nuiqsut only harvests during the fall; however, some Nuiqsut hunters travel to Barrow to participate with Barrow whaling crews during the spring (NSB 1998).

Before commercial whaling, there were over 50,000 bowhead whales (estimated) in the north polar region. Commercial whalers discovered the bowhead whale as early as 1611 in the eastern Arctic and in 1848 in the western Arctic. Unregulated commercial whaling continued into the early 1900s, reducing the bowhead whale populations to near the point of extinction. Bowhead whales have been completely protected from commercial whaling since 1946; Eskimos have hunted "the whale" for centuries. In accordance with International Whaling Commission rules, Eskimos are legally allowed to hunt an allocated number of bowhead whales each year for food and oil.

During 1987 to 1992, Barrow whalers harvested 7 to 22 bowhead whales each year; approximately 10 whales are harvested annually (Stoker 1983, SRBA and ISER 1993). Some Atqasuk residents are members of Barrow whaling crews and return with shares after a successful harvest. Nuiqsut whalers have had unsuccessful whaling years in the past (20 whales from 1972-1995), but their success has improved in recent years. Unsuccessful harvests were common in the 1980s, with no whales taken in 1983 to 1985, or 1988; however, in the 1990s, the only unsuccessful years were 1990 and 1994 (USDOI MMS 1996a, USACE 1998). Nuiqsut whalers harvest two to three whales annually. Anaktuvuk Pass is unlike the other NSB communities in that resource users have no direct access to the marine mammal resource that in many ways defines the Iñupiat of the coast.

Whaling continues to be the most valued activity in the subsistence economy of the communities, even in light of harvest constraints imposed by International Whaling Commission quotas. In part a result of whaling quotas, the number of bowhead whales of the Chukchi-Beaufort-Bering Sea is estimated to exceed 8,000, those of the eastern Canadian Arctic and of the Okhostsk Sea in far east Russia are in the hundreds. Although the number of bowhead whales has increased from depressed levels in the early 1900s, the cumulative effects of commercial whaling persist today, as bowhead whale numbers are only one-fifth of numbers estimated to have occurred before commercial whaling.

Oil and Gas Exploration and Development Activities

Seismic Studies, Exploration and Disturbance

Marine seismic exploration produces the loudest industrial noise in the bowhead whale habitat. Some seismic surveys are conducted in winter and spring on the sea ice, but most are done in the summer-autumn open-water period. Thus, bowhead whales and seismic boats are in the same areas during the westward fall migration. In the nearshore Alaskan Beaufort Sea, nearly all the fall-migrating bowhead whales avoided an area within 12 miles of an operating vessel, and deflection of the whales began at up to 21 miles from the vessel (Richardson 1997, 1998, 1999; NMFS 2002). Noise levels received by these whales at 12 miles were 117 to 135 dB (NMFS 2002).

Disturbance to fall migrating bowhead whales also has been shown in relation to offshore drilling in the Alaskan Beaufort Sea. At the 1992 Kuvlum site, the approaching fall-migrating whales began to deflect to the north at a distance of 19 miles east of the drilling platform and bowhead whale calling rates peaked at about the same distance (Brewer et al. 1993). At the 1993 Kuvlum #3 site, the whales were nearly excluded from an area within 12 miles of the drilling platform (Davies 1997; Hall et al. 1994).

During the 1986 open-water drilling operations at the Hammerhead site, no whales were detected closer than 6 miles from the drillship, few were seen closer than 9 miles, and one whale was observed for nearly 7 hours as it swam in an arc of about 15 miles around the drillship (LGL and Greeneridge 1987). The zone of avoidance therefore seemed to extend 9 to 15 miles from the drillship. Acoustic studies done at the same time provided received levels of drillship noise that can be related to the zone of avoidance. At 9 miles from the 1986 Corona, site received sound was generally 105 to 125 dB (LGL and Greeneridge 1987); at 6 miles from Hammerhead, received sound was generally 105 to 130 dB.

Summary of Past Effects and Their Accumulation. Hunting and disturbance are the two primary factors that have impacted bowhead whales in the past and have accumulated. Although bowhead whale populations have recovered from very depressed levels in the early 1900s, they are still about 80 percent below estimated levels at their peak. Noise and disturbance associated with offshore seismic and drilling activities, and boat and barge traffic have impacted whales, although their long-term effects, and likelihood of having cumulative impacts to whales, are unknown.

Future Effects and Their Accumulation

If oil and gas activities continue in the Alaskan waters of the Beaufort Sea, the major noise would be generated with marine seismic exploration. Other significant noise would continue to be produced by exploratory and production drilling, island construction, and vessel transit. The probable consequences are diversion of animals from their normal migratory path, possibly into areas of increased ice cover, and less use of the fall migration corridor as feeding habitat.

If two or more types of disturbance occur at the same time or in the same general area, the effects could be greater than those observed from single sources. The greatest diversion would occur if two or more seismic vessels operated simultaneously with one just offshore of the other. Such a disturbing influence set across the migratory path could displace the whales seaward into areas where ice conditions are more dangerous for hunters, prevent some whales from passing, reduce use of the area as feeding habitat, and affect the behavior of the animals.

Activities Not Associated With Oil and Gas Exploration and Development. Non-oil and gas activities could also contribute to cumulative effects on bowhead whales. A small number of bowhead whales could be injured or killed as a result of entanglement in fishing gear or collisions with ships. It is expected that subsistence whalers from Alaska and Russia would to continue to harvest bowhead whales under a quota authorized by the International Whaling Commission. The subsistence harvest is carefully managed to prevent population level effects, and to allow the Bering-Chukchi-Beaufort Sea bowhead whale population to continue to grow. Although a few individuals would likely be killed, non-oil and gas activities are not expected to have much impact on the bowhead whale population and bowhead whale populations have increased steadily under current management.

Oil and Gas Exploration and Development Activities

Noise and Disturbance

Under the cumulative case, bowhead whales could be exposed to increased disturbance as a result of existing leases, future sales in the OCS, and activities not related to oil and gas exploration and development. Projects and possible lease sales in the OCS that could affect bowhead whales have been summarized in earlier documents (USDOI BLM and MMS 1998:IV.G.10; 2003:V.11; USDOI BLM 2004c:4.A.3.5), and are not repeated here. Information about the potential effects of offshore lease sales on bowhead whales has been discussed in detail in several recent documents (USDOI MMS 1997a, USDOI BLM and MMS 2003, NRC 2003, USDOI BLM 2004c). Those documents, and references therein, are included here by reference.

Development of the National Petroleum Reserve – Alaska and elsewhere on the North Slope, and offshore lease sales in the OCS, would result in incremental increases in vessel traffic, particularly barge traffic to supply bases and camps on the North Slope. Such increases would result in a greater likelihood for disturbance to bowhead whales, should barge traffic coincide with the fall migration of bowhead whales from Canadian waters to the Bering Sea. Impacts caused by barge traffic should be limited to temporary displacement of the migratory whales, or local, short-term changes in whale behavior.

Disturbance to migrating bowhead whales has occurred from seismic activities and offshore drilling (summarized in NRC 2003). Richardson and Williams (2004) reported a statistically significant displacement of bowhead whales from Northstar Island in 2001 when noise associated with Northstar Island was the loudest. This effect was attributed to noise from maneuvering vessels rather than from the Northstar Island project itself. The authors noted that the "southern edge of the migration corridor was slightly farther offshore at the noisiest times as compared with typical times." Results in 2002 were considered equivocal and there was no evidence of an effect in 2003. However, should boat and barge traffic along the Beaufort Sea coast increase as a result of development in the National Petroleum Reserve – Alaska and offshore leases, deflection of the bowhead whale migration could occur. It is unlikely that such deflection would have high impacts on individual bowhead whales or the whale population, but the deflection of whales away from the coast could impact subsistence hunting of whales.

Aircraft (fixed-wing and helicopters) flying at altitudes greater than 1,000 feet AGL generally do not impact bowhead whales. Any impacts to bowhead whales from aircraft flying at altitudes less than 1,000 feet AGL (during takeoff and landing) would likely be localized and include minor short-term deflection or changes in behavior. Aircraft would not be expected to have much effect on individual bowhead whales or the population.

Spills

If an oil spill were to occur as a result of development and production associated with any past, present, or reasonably foreseeable future development project on the North Slope or in the Beaufort Sea, some bowhead whales could be impacted. However, most whales directly exposed to spilled oil would likely experience temporary, nonlethal effects from skin contact with oil, inhalation of hydrocarbon vapors, ingestion of oil-contaminated prey, baleen fouling, reduction in food resources, or temporary displacement from some feeding areas (NRC 2003). A few individuals could be killed if they were to experience prolonged exposure to freshly-spilled oil. Oil spill clean-up activities (e.g., vessel and aircraft traffic) could displace some bowhead whales, should those activities coincide with the fall migration and occur outside of Harrison Bay or other waterways within the barrier islands. Such displacement would minimize the potential for bowhead whales to be exposed to freshly-spilled oil, thereby reducing the potential for lethal effects. Impacts to bowhead whales from an oil spill are expected to be limited to short-term displacement or behavioral changes, and are not expected to have much cumulative impact on individual bowhead whale or the population. However, increasing exploration and development in the Beaufort Sea, coupled with production at Endicott and Northstar facilities, would increase the potential for a large oil spill to occur.

Abandonment
Noise from aircraft could, but in most instances would be unlikely to, disturb bowhead whales. The use of barges to remove materials from the Planning Area could also have localized impacts on bowhead whales if they were encountered during migration, but these effects would be short term and would not accumulate.

Global Climate Change

The tendency for bowhead whales to migrate closer to shore in light ice years versus heavy ice years in the mid-Beaufort Sea during autumn has been demonstrated (Moore et al. 2000; Treacy 2002b). McDonald and Richardson (2004) noted that the distribution of whales was close to shore in 2003. They estimated that roughly 75 percent of the population (~7,800 bowhead whales) came within about 17 miles of Northstar Island in the fall of 2003. Sea ice retreat over the last decade in the Beaufort Sea could lead to more exposure of bowhead whales to nearshore shipping noise.

Contribution of Amendment Alternatives to Cumulative Effects

Impacts to bowhead whales from development in the Planning Area would generally be similar to that discussed for marine mammals. The increased development scenarios of alternatives B and C, and the final Preferred Alternative, would contribute additional barge and aircraft traffic impacts and would require a greater number of coastal staging areas than the development scenario under the No Action Alternative. If additional staging areas along the Northeast National Petroleum Reserve – Alaska coast led to increased offshore exploration and development activities, the potential for cumulative impacts to bowhead whales by noise or other activities would increase. Should boat and barge traffic along the Beaufort Sea coast increase as a result of development in the National Petroleum Reserve – Alaska and offshore leases, deflection of the bowhead whale migration could occur. It is unlikely that such deflection would have high impacts on individual bowhead whales or the whale population, but the deflection of whales away from the coast could impact subsistence hunting of whales.

Conclusion

A few whales could experience sublethal or lethal effects from entanglement in fishing gear, collisions with ships, or encounters with subsistence whalers. Most activities related to oil and gas development onshore on the North Slope and in the Planning Area would not impact bowhead whales. There would be an increase in barge traffic that would contribute to cumulative impacts to bowhead whales from underwater noise and the presence of boat traffic. Bowhead whales could display a cumulative response to activities that produce underwater noise by increasing their distance from such sources by temporarily diverting their route of travel, or by temporarily changing their behavior. In general, these impacts would be minor and short term. Should development of the Planning Area stimulate greater interest in oil and gas activity offshore, these impacts could increase proportionately. Bowhead whales that come into contact with freshly-spilled oil could suffer temporary, non-lethal effects, and a few whales could suffer lethal effects. Bowhead whales could also be displaced by oil spill clean-up activities. Cumulative effects are likely to have only a minor impact on the bowhead whale population.

Spectacled and Steller's Eiders

Available information indicates that past, present, and future activities in the Planning Area, along migration routes, or on winter ranges could potentially contribute to cumulative effects on spectacled and Steller's eiders. These activities include subsistence and sport harvests (and associated lead contamination of eider habitat); commercial fishing; commercial development; wildlife research and surveys; proposed oil and gas exploration and development in nesting and wintering habitats; predation; environmental contamination; marine shipping; and recreation. Global climate regime shifts may also impact vegetation and other resources that could influence eider survival. Some of these activities may affect eiders at latitudes south of the Beaufort Sea and outside the summer breeding season, and may have affected eider populations as much or more than oil and gas activities on the North Slope and may have contributed to recent declines in these populations. Activities outside of the breeding grounds could result in oil or other toxic pollution effects, additional disturbance during the nonbreeding periods, or habitat loss or degradation that would add to cumulative impacts on listed eiders.

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development. Activities not related directly to oil and gas development that occur on the North Slope, including wildlife research and survey activities, subsistence harvest, predation, village expansion, and potential environmental contamination, may have contributed to past cumulative effects to eiders. These impacts were usually localized and would have affected only small numbers of eiders and likely did not accumulate at the population level.

Noise and ground activities at summer camps could have disturbed feeding, nesting, or brood-rearing eiders in close proximity to the camps, potentially affecting the birds energy budget and productivity. Although pedestrian traffic has been shown to be particularly disruptive to some waterfowl and raptors (Roseneau et al. 1981; Ritchie 1987; Johnson et al. 2003b), some eiders may have acclimated to predictable daily activities of camp personnel. Disturbance to birds from aircraft traffic and camp activities likely had the greatest affect within approximately 2,280 feet of the camps and little or no effect beyond 6,500 feet (Johnson et al. 2003b). Ward et al. (1999) studied brant response to fixed-wing and rotary-wing aircraft and reported brant response to aircraft at a lateral distance to 3 miles, although the majority of birds responded to aircraft that were within a lateral distance of ½ mile or less. The greatest response to aircraft altitude occurred between 1,000 and 2,500 feet. Tundra-nesting eiders near summer camps may have also suffered mortality or egg loss due to predators attracted to anthropogenic sources of food at camps.

Subsistence harvest of spectacled eider adults and eggs has impacted these species, although overall numbers of birds and eggs taken over their entire range are not known. Spectacled and Steller's eiders provide an important food source for residents of Barrow, although common and king eiders are likely the species harvested most often by subsistence hunters due to their greater abundance. Atqasuk hunters also harvest eiders. Spectacled eider densities are medium high to high near Barrow and Atqasuk, thus opportunities to harvest this species near these areas may be greater than in other portions of the National Petroleum Reserve – Alaska (see maps 3-33 and 3-34). Nuiqsut hunters harvest eiders and gathered and stored eggs from eider nests on the tundra. According to 2003 interviews, eggs are no longer gathered, and many residents avoid harvesting spectacled and Steller's eiders because they are a threatened species (see Appendix J).

Aside from direct mortality due to subsistence harvest, the accumulation of lead shot in eider foraging habitat in the Y-K Delta has likely been responsible for loss of spectacled eiders.

Non-oil and gas development at former military and other government sites and in villages has caused the loss of habitat and increased levels of disturbance. These sites also provide a potential starting point for hunting trips. Approximately 2,500 acres have been developed, with most of this development along the coastline, where eiders are found. Although there is limited information on historic numbers of eiders found in these non-oil and gas developed areas, development, loss of habitat, and disturbance, coupled with hunting pressure at "shooting station" near Barrow, and other recreational and subsistence hunting near other villages, has caused the loss of birds and habitat that has accumulated.

Oil and Gas Exploration and Development Activities

Seismic Activity and Exploration

Loss of habitat and disturbance are the two primary factors associated with seismic activities and exploration that could affect eiders on the North Slope. Most seismic surveys and exploration drilling activities would occur during the winter months when eiders are not present in the Planning Area. Therefore, these activities would have no direct impacts that would accumulate.

The use of airguns for boat-based seismic work in Teshekpuk Lake during the summer may have temporarily displaced eiders from feeding habitats while surveys were being conducted. Spectacled eider densities are medium high to high northeast of Teshekpuk Lake, and Steller's eiders have been seen nesting near Teshekpuk Lake (see maps 3-33 and 3-34). Eiders near the shoreline could have been temporarily or permanently displaced from nests

by boat disturbance, however, these surveys have only occurred a few times in the past, and it is unlikely that effects to eiders have accumulated.

Rolligons and track vehicles used during seismic exploration have left tracks on tundra habitats and many of these tracks are still observable years later (Kevan et al 1995). However, less than 100 acres of habitat has scars persisting today that could result in habitat loss for eiders. Studies of seismic and camp-move trails created in the 1980s showed that only a small portion of seismic trails were still in evidence 8 years later, but that 5 percent of camp-move trails still showed moderate to high disturbance. Use of lightweight vehicles, dispersing traffic patterns, minimizing sharp turns, and requiring surveys to be done when snow and frost cover is adequate to protect the tundra have helped to minimize damage to vegetation used by eiders (Walker 1996).

Other sources of vegetative loss included gravel pads, airstrips, and roads near gravel structures at exploration sites. Peat roads constructed in the 1960s caused disturbances to tundra habitats that persist today. However, some evidence suggests that bird use of peat roads is similar to that of adjacent areas of undisturbed tundra (TERA 1991). Based on NRC (2003), in 2001, approximately 1,200 acres had been impacted by exploration sites in the past, and 740 acres of disturbance were still evident. Most of these sites were developed before 1977, thus, their effects on the vegetative landscape have persisted for decades, and are likely to persist for several more decades. As industry has shifted towards use of ice roads and ice pads during exploration, loss of habitat from seismic activities and exploration has slowed greatly. Still, ice roads and pads have effects that could impact eider habitat for several years, but would be unlikely to accumulate.

Water used in the construction of ice roads and pads has been withdrawn from deep lakes in areas adjacent to the road and pad locations. Winter water withdrawal has altered lake levels and adjacent habitats, although flooding and recharge during spring break-up have minimized the potential for long-term effects (Rovansek et al. 1996). Lake recharge during spring has probably limited effects on invertebrate populations used for food by birds in the spring, although these effects have not been studied directly. Bergman et al. (1977) and Derksen et al. (1981) reported that lakes with pendent grass had high levels of use by birds and seemed to be important to loons and waterfowl. Since use of lakes in the past has varied, and few lakes would have had water withdrawn over several years, it seems unlikely that the effects of past use of lakes for water withdrawals would accumulate.

Infrastructure and Road and Pad Construction

Effects to birds from loss of habitat from road and pad construction and gravel mining, and disturbance associated with development and production activities have occurred in the past and persist today. Gravel roads, gravel pads, and gravel mines have caused the direct loss of eider habitat, and also have led to the indirect loss of habitat from the effects of road dust and alteration of natural drainage patterns. Although over 500 acres of peat roads still show evidence of disturbance, it is not clear that this disturbance has resulted in negative impacts to birds. Gravel footprints have impacted over 9,200 acres, and loss of vegetation and habitat associated with gravel footprints persists today. Gravel mines have impacted another 6,360 acres of vegetation, but over 4,500 acres of gravel mines had been reclaimed, much of it to deepwater lake habitat that would have some value for eiders.

The passage of vehicle traffic over gravel pads and roads results in dust and gravel being sprayed over vegetation within about 30 feet of the pad or road, and a noticeable dust shadow out to 150 feet or more. Within 30 feet of gravel structures, the dust and gravel can smother vegetation. The magnitude of these effects on habitat used by birds would depend on the duration of dust exposure (i.e., traffic intensity) and the distance from the source. Traffic volume and speed would generally be low on in-field roads, which would limit dust impacts to vegetation. Based on assumptions used in this amendment, approximately 30 acres of vegetation have been impacted by dust for each 100 acres of development, suggesting that 2,700 acres of vegetation may be indirectly affected by existing gravel roads and pads on the North Slope. These impacts are likely to persist as long as vehicle travel occurs on the pads and roads.

Construction of gravel pads, roads, and airstrips has altered the moisture regime of tundra near these structures by producing areas of snow accumulation and by changing natural drainage patterns. Snowdrifts caused by gravel structures increase the wintertime soil surface temperature and increase thaw depth in soils near the structures.

These impacts are exacerbated by dust deposition and by the formation of impoundments. These factors have combined to warm the soil, deepen thaw, and produce thermokarst adjacent to roads and other gravel structures (NRC 2003). However, impoundments have created new feeding and brood-rearing habitat that has been beneficial to some bird species. These effects, both beneficial and adverse, persist today on approximately 18,000 acres on the North Slope.

Disturbance

Numerous types of disturbances have resulted from oil and gas exploration, development, and production activities, including those caused by aircraft, vehicular, pedestrian, and vessel traffic, construction and drilling activities, noise and activity at facilities, and predator attraction. Impacts have been most prevalent where facilities were located in habitats with high bird concentrations, or if species with low population numbers or declining populations, such as threatened eiders, were disturbed.

Murphy and Anderson (1993) reported disturbances to birds as far as 500 to 685 feet from roads. Avoidance of roads, however, may have been related to an avoidance of heavily dusted areas on tundra adjacent to roads with high traffic levels rather than an avoidance of vehicular activity itself. Disturbance to waterfowl from aircraft is well documented (e.g., Schweinsburg 1974; Ward and Stehn 1989, Derksen et al. 1992, McKechnie and Gladwin 1993; Ward et al 1999). Johnson et al. (2003b) conducted the most thorough study of aircraft disturbance to waterfowl in Arctic oil fields at the Alpine field. Responses of birds to aircraft included alert postures, interruption of foraging behavior, and flight. Aircraft disturbances could displace birds from feeding habitats and negatively impact energy budgets. Gollop et al. (1974b) and Ward et al. (1999) suggested that helicopters may be more disturbing to wildlife than low-flying fixed-wing aircraft, although Balogh (1997) indicated that fixed-wing aircraft flown at 150 feet AGL often caused spectacled eiders to flush, while helicopters flown at similar altitudes in the vicinity of Prudhoe Bay did not. The potential effects of routine aircraft flights into airstrips would range from bird avoidance of certain areas to abandonment of nesting attempts or lowered survival of young. Johnson (1984) reported that at least three successful common eider nests were located within 975 feet of a helicopter pad on Thetis Island that averaged approximately 12 trips per day. Although the potential exists for displacement of some nesting birds near routinely used aircraft landing sites as a result of numerous overflights, landings, and takeoffs, some birds may habituate to routine air traffic. Given the relatively low density of spectacled and Steller's eiders nesting in the National Petroleum Reserve – Alaska, disturbance resulting from aircraft activity would likely affect only a small percentage of the total populations of spectacled and Steller's eiders. The cumulative effects of disturbance on the North Slope have added only incrementally to impacts on eiders.

Predators

Predators such as glaucous gulls, Arctic foxes, ravens, and grizzly bears are attracted to anthropogenic food sources associated with oil field development, which may cause increased predation pressure on tundra-nesting eiders. There is evidence that nesting success for several species of ground-nesting birds may be lower in oil fields than in undeveloped areas (Troy 1996; Anderson et al. 2000; Sedinger and Stickney 2000). It is not known if these effects to eiders have been substantial enough to accumulate.

Collisions

Bird mortality has resulted from collisions with buildings, vehicles, aircraft, vessels, towers, pipelines, platforms, or other structures associated with onshore and offshore oil and gas development. Offshore activities are most likely to impact birds during the late summer/fall staging period, when relatively large numbers of loons, long-tailed ducks, eiders, and other waterfowl are staging and molting in marine areas. Eider collisions with vehicles, buildings or oil field infrastructure probably do not represent a significant source of bird mortality at the population level. However, eider losses due to collisions in developed areas accumulate with increases in development and add incrementally to other impacts.

Spills

No large oil spills have occurred on the North Slope. Small spills have occurred but cleanup and rehabilitation efforts have been successful and relatively few birds have been impacted (NRC 2003).

Marine Activities

Offshore oil exploration and development in state or federal marine waters of the North Slope rely on helicopter and barge traffic more than on fixed-wing flights. Much of this activity occurs during the winter when eiders are not present. However, helicopter activity, barge and crew vessel traffic, and spill response training activities also occur during the summer. During the summer open-water seasons of 2001 and 2002 at the Northstar development off Prudhoe Bay, helicopter activity ranged from 477 to 989 round trips, crew vessel activity ranged from 469 to 824 round trips, and barge traffic ranged from 63 to 64 round trips (Williams 2002, Williams and Rodrigues 2003). Vessel traffic not related to oil development also occurs in marine waters off the coast of the North Slope. These disturbances may have displaced eiders from feeding and loafing areas and had a minor, short term impact on eiders.

Factors Outside of the North Slope. Numerous other factors could affect eiders at various locations around the world. Various types of contaminants and toxins from industrial and agricultural activities can enter either terrestrial or marine environments and affect eider mortality or reproductive success. Oil spills have been an obvious source of bird mortality at numerous locations around the world. Commercial fishing activities can cause changes in predator-prey relationships that could affect eiders that feed in offshore marine habitats. Eiders could also become entangled in fishing gear currently being used in commercial fishing activities or in abandoned gear that persists in marine environments. Many waterfowl species are hunted for sport during the fall migration and on the wintering grounds.

Subsistence harvest of spectacled eider adults and eggs has impacted these species, although overall numbers of birds and eggs taken over their entire range are not known. Aside from direct mortality due to subsistence harvest, the accumulation of lead shot in eider foraging habitat in the Y-K Delta is likely responsible for loss of spectacled eiders. Although the proposed development scenario does not include a road connecting Nuiqsut with roads in the Planning Area, future construction of a road could allow access that would increase subsistence hunting pressure on spectacled and Steller's eiders, and increase the potential for lead shot contamination of eider feeding habitats. It is currently illegal to use lead shot while hunting waterfowl, although lead shot is allowed for hunting upland species. Illegal use of lead shot for hunting waterfowl, or legal use of lead shot for hunting upland species near waterfowl habitats, could contribute to the effects of lead poisoning on eider populations. Programs currently are underway by the USFWS and the NSB to inform hunters of harvest closures on these two species in an effort to decrease this source of mortality. Development along migration corridors and in wintering areas may result in habitat loss or disturbance that add to the cumulative impacts on bird populations. All of these factors can add to the cumulative loss of individual birds, and in some instances, can have population-level effects.

Summary of Past Impacts and Their Accumulation. Approximately 2,500 acres have been disturbed from non-oil and gas development on the North Slope. Although only a small portion of this area would have been used by eiders, much of it has occurred along the coastline and near Barrow, areas where spectacled and Steller's eiders are often seen (see maps 3-33 and 3-34). Oil and gas activities have directly impacted approximately 13,000 acres of bird habitat, and indirectly impacted approximately 21,000 acres. Since most of these impacts are associated with ongoing non-oil and gas residential and commercial developments, as well as oil and gas activities, these impacts to habitat are additive to future impacts and would be likely to persist for several decades or more, in the absence of an active reclamation program. Eider populations are greatest northeast of Teshekpuk Lake, and west of the Planning Area, thus the amount of eider habitat impacted by development is probably minor, but could increase in the future. Currently, the impacts of predators on bird populations may be reduced compared to the early years of oil field development, as industry has reduced the amount of garbage that is available in fields to attract predators. Other effects, including disturbance, are difficult to measure, but are likely accumulating as the number of developments and the amount of developed area increase. The gravel footprints of current developments are reduced compared to the footprints of previous oil field development, resulting in less habitat loss in modern oil fields. However, new development often relies on aircraft support for transportation of personnel and equipment that can increase disturbance to feeding, nesting, and molting eiders. Habitat loss and disturbance can add incrementally to the impacts of development on eiders.

Future Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development. Subsistence harvest of spectacled eider adults and eggs apparently continues to impact these species, although overall numbers of birds and eggs taken over their entire range are not known. Aside from direct mortality due to subsistence harvest, the accumulation of lead shot in eider foraging habitat in the Y-K Delta is likely responsible for loss of spectacled eiders. Although the proposed development scenario does not include a road connecting Nuiqsut with roads in the Planning Area, future construction of a road could allow access that would increase subsistence hunting pressure on spectacled and Steller's eiders, and increase the potential for lead shot contamination of eider feeding habitats. It is currently illegal to use lead shot while hunting waterfowl, although lead shot is allowed for hunting upland species. Illegal use of lead shot for hunting waterfowl, or legal use of lead shot for hunting upland species near waterfowl habitats could contribute to the effects of lead poisoning on eider populations. Programs currently are underway by the USFWS and the NSB to inform hunters of harvest closures on these two species in an effort to decrease this source of mortality. DEW-Line sites, other military facilities, villages, airstrips, and other non-oil and gas infrastructure are likely to persist into the indefinite future. Villages are likely to increase in size, causing the potential loss of additional habitat.

Oil and Gas Exploration and Development Activities

Aircraft and Vessel Disturbance

Central Production Facility developments with satellite fields connected by gravel roads are proposed for the Planning Area and elsewhere on the North Slope. In addition, several staging areas and gravel extraction sites are also proposed. If CPF developments were connected to each other or to North Slope communities or existing oil fields by roads, they would likely require substantial fixed-wing aircraft and helicopter support, and occasional barge support during periods when eiders are present.

Oil exploration and development, which could occur in state or federal marine waters offshore of the Planning Area, would rely more on helicopter and barge traffic and less on fixed-wing flights. Much of this activity would occur during the winter when eiders are not present. Helicopter and barge and crew vessel traffic, and spill response training activities, could also occur during the summer. During the summer open-water seasons of 2001 and 2002, helicopter activity at the Northstar Development near Prudhoe Bay ranged from 477 to 989 round trips in each season. Crew vessel activity ranged from 469 to 824 round trips, and barge traffic ranged from 63 to 64 round trips at (Williams 2002, Williams and Rodrigues 2003). Vessel traffic not related to oil development also occurs in marine waters off the coast of the Planning Area.

Fixed-wing and helicopter air traffic activity at the Deadhorse Airport, and at the Kuparuk and Alpine field airfields, is likely to represent the greatest source of air-traffic disturbance to eiders from currently developed areas. Any aircraft-related disturbance from new developments on the North Slope would represent additive effects. Continued activity to support future development on the North Slope likely would result in additional low-altitude flights over nesting, brood-rearing, staging, or migrating spectacled and Steller's eiders. Flight corridors would be established at remote airstrips in the Planning Area for transfer of equipment, supplies, and personnel, and for survey flights for wildlife or pipeline monitoring. The effects of disturbance from these activities could result in temporary or permanent displacement of foraging, nesting, brood-rearing, or molting/staging eiders, temporary or permanent nest abandonment, or alteration of eider energy budgets. Long-term displacement (1 year or more) from heavily used corridors could result in fewer young produced and somewhat lower survival of adults. However, some individuals might tolerate this level of disturbance and nest, rear broods, or forage within the air traffic corridor. Given the relatively low density of spectacled and Steller's eiders nesting in the National Petroleum Reserve – Alaska, disturbance resulting from aircraft activity would likely affect a small percentage of the total populations of spectacled and Steller's eiders.

Offshore air traffic could affect spectacled and Steller's eiders during the spring when birds are migrating to the breeding grounds, and during the summer and fall when birds are staging and/or molting prior to fall migration. Few spectacled or Steller's eiders would be likely to occur in the waters of the Chukchi and Beaufort seas during

spring migration, and disturbance related to aircraft over-flights would likely be minimal at this time. Because open leads used by eiders as feeding habitat during spring migration are limited, however, disturbance during this period could affect eider energy budgets and be critical to the survival of the eiders migrating to these areas during spring. Spectacled eiders are likely to occur in higher numbers in offshore waters during summer staging; however, much more habitat is available at this time, and eiders disturbed by aircraft over-flights are likely to return to preferred feeding habitats or move to nearby areas to feed.

Vessel traffic associated with onshore development in the Planning Area, or with offshore development in state or federal waters, could disturb spectacled and Steller's eiders. The majority of barge traffic used to transport fuel, equipment, and supplies for onshore development would likely be staged from Prudhoe Bay, which has road access to ports at Anchorage. Barge traffic from Barrow would arrive from the west. Barge traffic would not occur until the open-water period begins in mid-July, and would not cause any disturbance to eiders migrating in the spring. Eiders staging in Harrison Bay or Smith Bay prior to fall migration could be temporarily displaced from feeding habitats by barge traffic, although most spectacled eiders would likely be further offshore than projected barge routes. Barge traffic from the Prudhoe Bay area to support offshore development could potentially impact eiders by causing temporary or permanent displacement from preferred feeding habitats. The extent of the impacts would depend on the location of the offshore development, the number of trips, and the vessel route. These additional effects would be additive with respect to cumulative effects to North Slope eider populations.

Vehicle Disturbance

Vehicular traffic and machinery noise and activity have the potential to affect spectacled and Steller's eiders in newly-developed areas on the North Slope. Similar types of disturbance occur in association with activities in existing North Slope oil fields. Construction of connecting oil development areas in the Planning Area with Nuiqsut or the existing Alpine field could increase traffic and disturbance levels in areas used by eiders, and may increase subsistence hunting activities in the Planning Area. These additional effects would be additive with respect to North Slope eider populations.

Other Disturbance Factors

In addition to the disturbance sources discussed above, disturbance may be caused by human presence associated with offshore exploration, construction and drilling activities, oil spill cleanup, subsistence hunting in newly accessible areas, and the attraction of predators to areas of human habitation. These factors would vary considerably in the amount of disturbance caused. Future offshore seismic exploration could affect spectacled eiders in marine waters of the Beaufort and Chukchi seas. Lacroix et al. (2003) studied long-tailed ducks and their reactions to seismic activities in the central Beaufort Sea and reported no major effects of seismic activity on movements and diving behavior. However, logistical and ecological factors may have limited their ability to detect subtle effects of seismic disturbance. Offshore seismic activities could potentially displace threatened eiders from preferred feeding habitats, and the changes to energy budgets could affect the survival of some birds.

Future development in the Planning Area or offshore areas would lead to an increase in the amount of human activity by the presence of oil field workers on roads, pads, or offshore structures; from increased activity by subsistence hunters or other recreational activities; or from activities of researchers conducting ground-based surveys for wildlife. Predators, such as foxes attracted to development areas, could cause losses of eider eggs or young. Much disturbance associated with commercial activities (excluding oil spill response) could be controlled by mitigation (or lease stipulations and ROPs, as proposed in this amendment). Although it is likely that behavioral effects to threatened eiders resulting from disturbance associated with oil and gas development would be additive to naturally occurring disturbances, there is no evidence for synergism, in which the combination of effects from natural and/or development-related factors would be greater than their additive effects.

Habitat Alteration

Temporary habitat loss or alteration could result from delayed snowmelt caused by accumulation of snow on tundra adjacent to roads and pads, dust deposition on tundra adjacent to roads and pads, thermokarst, seismic or other winter activities that affect tundra vegetation, and water withdrawal from lakes for winter construction activities. Permanent habitat loss would result from gravel mining and gravel placement to construct roads and

pads. The formation of impoundments adjacent to roads and pads could result in temporary or permanent habitat loss or alteration. There is some evidence that impoundments may provide some additional habitat for spectacled eiders (Anderson et al. 1992; Warnock and Troy 1992; Noel et al. 1996), and that the formation of impoundments may not have negative impacts on threatened eiders. Similar types of habitat loss and alteration have occurred in the existing North Slope oil fields, and could occur in the Northwest National Petroleum Reserve – Alaska if future oil and gas development occurs there. In addition, future offshore development would have the potential to affect onshore spectacled and Steller's eider habitats, should gravel mining activities be required for construction of offshore drilling and production sites.

Although the increase in the amount of area disturbed by oil and gas development has slowed dramatically in recent years, it is estimated that an additional 3,500 acres would be covered by gravel, and 500 acres impacted by gravel mines, in the next 25 years, much of this in the Planning Area. Approximately 9,200 acres would be indirectly affected by dust, changes in hydrology, and thermokarst. An additional 4,000 acres of potential eider habitat could be directly impacted by oil and gas activities between 2030 and 2055 and 9,200 acres could be indirectly impacted by development.

These impacts could be additive to the impacts to eider habitat that have accumulated in the past and persist today, but in the context of the ACP and North Slope, these cumulative impacts would be small. Based on direct (21,000 acres) and indirect (36,000 acres) impacts that could still persist in 2050, direct and indirect impacts to potential eider habitat from activities on the North Slope would impact approximately 0.43 percent of the ACP and 0.10 percent of the North Slope. These estimates do not take into account the quality of habitat that would be impacted on the North Slope, or even if the affected habitat was suitable for eiders. However, it is likely that the focus of future oil and gas exploration and development would be within the Barrow Arch, which is located in the ACP. Highest population densities of spectacled eiders in the eider survey area on the North Slope are to the east of Teshekpuk Lake, near Cape Halkett (Map 3-33). Steller's eiders are also found to the north and northeast of Teshekpuk Lake (Map 3-34). Thus, impacts to eiders from development could be greater if development occurs in areas with high population densities of eiders.

Predation

There is evidence that predators of eiders, such as the Arctic fox, glaucous gull, and common raven, could be attracted to areas of oil field development by anthropogenic sources of food and denning or nesting sites. Increases in the numbers of predators in areas of development could have an additive impact on the effects of predation on threatened eiders. In recent years, North Slope oil field developers have installed predator-proof dumpsters to minimize attraction of predators to development. Lease stipulations were established, in part, to prevent human-caused increases in predator populations and require the adoption of methods to avoid attracting wildlife to sources of food, and to use the best technology available to prevent facilities from providing nesting, denning, or shelter sites for ravens, raptors, and foxes.

Collisions

Eider mortality could result from collisions with buildings, vehicles, aircraft, vessels, towers, pipelines, platforms, or other structures associated with onshore or offshore oil and gas development. Offshore activities would be most likely to impact eiders during the late summer and fall staging periods, when relatively large numbers of eiders are found in marine areas. Migration pathways of eiders may include areas where offshore production facilities are constructed, so collisions between eiders and offshore structures, and watercraft and helicopters used for transport of personnel and equipment or responding to an oil spill, could occur. Research currently is being conducted to assess the potential for collisions between birds and offshore oil-producing facilities and to develop methods by which collisions can be reduced (Day et al. 2003a, b). The potential number and locations of offshore sites and their effects on spectacled and Steller's eiders would be additive to existing effects in North Slope oil fields. If these facilities were built in the future, consultation with the USFWS would occur to address potential impacts.

Spills

The oil industry is required to have oil spill response and cleanup capabilities, and it is expected that small spills in the Planning Area or in existing or future North Slope oil fields would be contained and cleaned up before

substantial impacts to eiders would occur. A large onshore spill released in the Planning Area during the summer season could affect pre-nesting, nesting, and brood-rearing eiders. In the immediate vicinity of the spill, some habitat contacted by oil would become unsuitable for nesting, brood-rearing, or foraging by eiders, and oil entering freshwater aquatic habitats could spread more widely, potentially entering river deltas and nearshore marine habitats. Direct mortality could occur from loss of insulating capabilities of feathers, should eiders come in contact with oil, or by ingesting of contaminated prey. These effects would be additive to the effects of a spill in the existing North Slope oil fields, or to the effects of potential future spills in the Northwest National Petroleum Reserve – Alaska. Spectacled and Steller's eiders could also be affected by oil spills in other coastal lagoons and marine areas in molting or wintering areas.

If future oil field development were to occur in state or federal marine waters offshore of the Planning Area, there would be a low probability of a large oil spill. If one or more spills were to occur, substantial losses could result to eiders if oil were released during the summer/fall season when eider flocks were present. The number of eiders affected could potentially total tens to hundreds of individuals. Using average estimated spectacled eider density calculated from the USFWS survey data in the central Beaufort Sea area from Harrison Bay to Brownlow Point, and average severity of spill-trajectory paths (and thus, exposure of birds to oil), a USFWS model estimated an average of two eiders would be exposed to a large spill (5,912 barrels) within 30 days in July (Stehn and Platte 2000). However, in late July one group of 100 individuals was observed, suggesting a potential for much higher mortality should a spill occur in an area of relatively high spectacled eider density. An offshore oil spill with the greatest potential to impact spectacled eiders would be one that occurred in the deeper offshore waters of Harrison Bay, rather than in the offshore waters to the east or the shallower nearshore waters. An oil spill could also contaminate prey populations in eider foraging areas at any time of year, resulting in secondary impacts to eiders by affecting productivity and/or survival. Likewise, a spill on shoreline or coastal marsh habitat could affect eiders that were moving from onshore brood-rearing areas to the marine environment, or that inhabited the area in subsequent years. Molting and/or staging spectacled or Steller's eiders are known to use the lagoon systems in offshore areas of the Beaufort and Chukchi seas and Norton Sound. Hundreds to thousands of spectacled eiders could be impacted by an offshore spill that occurred in areas of high bird use, such as Kasegaluk Lagoon or Ledyard Bay in the Chukchi Sea and Norton Sound.

Global Climate Change

Much research in recent years has focused on the effects of naturally-occurring or man-induced global climate regime shifts and the potential for these shifts to cause changes in habitat structure over large areas. Naturally occurring plant succession on the North Slope is a relatively slow process (Billings and Peterson 1980), but how future global climate change may affect this process is unknown. Although many of the forces driving global climate regime shifts may originate outside the Arctic, the impacts of global climate change are exacerbated in the Arctic (ACIA 2004). Temperatures in the Arctic have risen faster than in other areas of the world as evidenced by glacial retreat and melting of sea ice. A few bird species, such as black guillemot, that feed near the ice edge may not be able to bring food to their young as the pack ice moves further offshore.

The increasing thickness of the active layer of soil above Arctic permafrost is likely to cause changes in moisture regimes and the distribution of vegetation types over much of the Arctic in coming years. Thawing of the permafrost may result in increased amounts of surface water in some areas. Areas of permafrost with substrates composed of fine-grained materials may be susceptible to drying, erosion, and desertification (ACIA 2004). Rising temperatures are likely to favor the expansion of the northern boreal forest into areas currently occupied by tundra. Studies suggest that climate change may increase woody vegetation on the North Slope (Chapin et al. 1995). Changes to the predominant vegetation type in areas dominated by sedges and grasses could influence use of those areas by threatened eiders. Global climate change may also result in an increase in shrubs at the expense of forbs and graminoid vegetation characteristic of arctic tundra. This could result in a loss of breeding-season habitat for threatened eiders. Rising seal levels resulting from increasing temperatures may further reduces the amount of tundra habitat available to nesting eiders by causing coastal erosion and by inundating low-lying areas. Such intrusion of salt water would be unfavorable to woody vegetation and would shift plant species toward those more tolerant of saline conditions (Funk et al. 2004). Salt marsh in general is considered high value habitat for waterfowl

including the threatened eiders. These changes may be beneficial to some species, such as those associated with boreal forest or shrub habitats, but a reduction in the amount of tundra habitat available could negatively impact threatened eiders and other tundra-nesting birds.

Contribution of Amendment Alternatives to Cumulative Effects

Potential impacts to eiders and eider habitat from seismic surveys in the Planning Area would occur on approximately 150 (Alternative A) to 200 (alternatives B, C, and D) acres. Impacts from ice road construction could occur on another 210 acres annually, while impacts from ice pads could occur on 30 to 270 acres during the life of the project; these impacts to habitat would be short-term and would not accumulate.

Development in the Planning Area would directly and indirectly impact 790, 3,480, 4,210, and 2,810 acres of potential eider habitat for alternatives A through D, respectively, if oil prices average $25/bbl. Wetlands, which are important to waterfowl and shorebirds, would comprise approximately 95 percent of this habitat loss. These habitat losses would account for 3 to 14 percent of the habitat projected to be lost due to development on the North Slope during the next 50 years. Given that the area most likely to developed under the action alternatives is located north and northeast of Teshekpuk Lake, areas that support some of the highest nesting densities of eiders on the North Slope, impacts to eiders could be much greater than predicted based on amount of area disturbed (maps 3-33 and 3-34). Depending on the types and locations of facilities, impacts to spectacled and Steller's eiders could accumulate, especially where species are concentrated, and affect the long-term health of the population. The effects to eiders from oil and gas development would be less under the No Action Alternative and Alternative B, because all (No Action Alternative) or most (Alternative B) of this area would be closed to leasing under these alternatives. The effects would be greatest under Alternative C, since the entire area would be open to leasing. The effects from the final Preferred Alternative would be less than Alternative C, but greater than Alternative B, since some development could occur within this area.

Conclusion

The cumulative effects to spectacled and Steller's eiders caused by future developments both onshore and offshore of the Planning Area, and on lands to the Northwest National Petroleum Reserve – Alaska, would likely be greater than those caused by activities associated with the amendment alternatives alone. Given that oil and gas activities are more likely in the northern ACP, an area of the ACP where eider densities are greater, impacts to eiders would likely be greater than those based on the amount of area of ACP impacted. Disturbance of some individual eiders as a result of both onshore and offshore oil and gas operations is probably unavoidable over the long term. The cumulative effects from typical activities associated with exploration and development of oil and gas prospects in the Planning Area, lands to the west, and adjacent marine areas, could include small declines in local nesting or loss of small numbers of spectacled eiders, and potentially Steller's eiders, through effects on survival and productivity, predation pressure enhanced by human activities, and collisions with structures.

Declines in eider fitness, survival, or production of young could occur where eiders were exposed frequently to various disturbance factors, including aircraft and vehicular traffic and noise; pedestrian traffic; or noise from machinery, equipment, and facilities that could disturb nesting or brood-rearing eiders, or attract predators, and result in predation of eggs or young. In addition, potential increases in subsistence use and contamination of eider habitats could also add to existing development impacts. The effects of habitat loss and alteration would also be additive to those from existing development, although improvements in oil field construction and technology in recent years have provided methods to reduce development footprints. The effects of future project infrastructure on eider populations, although additive to natural effects, would be expected to be less severe than those caused by previous Arctic oil field developments.

Oil spills could cause direct or indirect eider mortality. Scenarios developed to address potential risks to eiders from oil spills generally report that low numbers of spectacled eiders would likely be affected; however, an offshore spill in an area of spectacled eider concentration could impact tens or hundreds of birds. Direct mortality to threatened eiders could also occur by collisions with vehicles or infrastructure. Overlap among the various sources of cumulative impacts could result in a reduced ability for threatened eider populations to recover from the

potential negative effects of North Slope development, as well as from anthropogenic effects or natural occurrences anywhere in the species' range.

4.7.7.11 Cultural Resources

Cultural resources, including archaeological and historic sites and materials as well as traditional cultural properties, have a very limited ability to absorb cumulative impacts. Cultural resources are not a renewable resource. Cultural resources risk being destroyed by erosion, construction, excavation, data collection, and looting, through the removal of artifacts from their surrounding contexts, moving the material such that it loses context, or the removal or re-deposition of artifacts and their surrounding context to another location. Cultural properties, including camps, cabins, hunting and fishing sites, graves, and areas of particular religious or traditional importance, lose their integrity, and thus their potential eligibility for the NRHP, when they become degraded as a result of natural or human disturbance processes, or when the people who value these places can no longer access them, thus losing their cultural connection to the site over time.

The following section discusses the cumulative impacts on cultural resources as they occur from the past into the reasonably foreseeable future (1900-2100). Several key factors, as discussed in Section 3.4.1, could contribute to impacts on North Slope cultural resources during this time period, including oil and gas exploration (1920s through the present), military activity following World War II (e.g., DEW-line and White Alice Communication System [WACS]), federal laws and regulations concerning impacts to cultural resources (e.g., National Historic Preservation Act [1966], NEPA [1969], Archaeological Resources Protection Act [1979]), archaeological surveys (Section 106 and National Petroleum Reserve - Alaska 105(c) studies), and the collection of oral history and traditional land use sites by the NSB (e.g., Traditional Land Use Inventory).

Past Effects and Their Accumulation

Before oil and gas exploration and development, North Slope cultural resources were subject only to the effects of the natural environment, such as the forming, deforming, and destroying of existing sites, and the effects of human activity, such as Native people reusing found objects and materials, and explorers and other visitors taking material from the sites. Activities which have had the greatest affect on cultural resources in the National Petroleum Reserve – Alaska and along the Arctic Coast are most likely linked to both oil development and military activity, given that the area was designated as a Naval Petroleum Reserve in 1920.

Interest in the geology and archaeology of the North Slope began in earnest at the beginning of the 20th century, but access was generally limited to coastal or easily accessible areas (see Section 3.4.1.8 [European/Euro-American Expansion, Exploration, and Ethnographic Research). Effects to cultural resources in the National Petroleum Reserve – Alaska have been occurring since 1923 when oil and gas exploration and mapping began with USGS surveys of the Reserve, assisted by Native guides such as Simon Paneak. Early oil and gas ground-disturbing activities conducted by the U.S. Navy included exploratory drilling and geophysical and geological surveys, beginning in 1944, and shallow core tests and test wells drilled between 1945 and 1952. During this period, about 3,400 miles of seismic-reflection surveys and 391 miles of seismic-refraction surveys were completed within and adjacent to the Reserve (see Section 4.7.3.1; Past Exploration, Development, and Production on the North Slope and in the Planning Area). There has been little documentation of these early impacts, and there is no record of cultural resource identification or mitigation efforts from this early time period.

With the onset of the Cold War, military activity on the North Slope also affected cultural resources. During the 1950s, ground-disturbing activities associated with the rapid construction of the DEW-line and White Alice Communication System sites affected cultural resources; however, no effort was made during this period to mitigate effects to cultural resources potentially affected by industrial or military activities, despite protection provided to cultural resources under the Antiquities Act of 1906. Public testimony and historical literature have noted that cultural resources were disturbed or destroyed and access to traditional use sites was limited by industrial and military activity during this time period (Brown 1979). During the 1998 scoping meeting in Barrow

for the Northeast National Petroleum Reserve – Alaska, Arnold Brower, Jr. noted that his grandfather's house and dwelling in Brownlow Point was demolished so that the DEW-line could have an airport in the same location.

Continued and increasing amounts of oil and gas exploration and drilling across the North Slope further affected cultural resources and Native peoples' relationships with their ancestral homelands. Following Alaska statehood in 1959, land selections were made by the state and federal governments, which did not include Native land ownership except as provided for under the Indian Allotment Act of 1906. No effort was made at that time to inventory, identify, record, or document Native land use or historic and archaeological sites as a result of these land selections. As a result of this lack of strong legal protections, oil development and production during this initial period severely impacted cultural resources and diminished some peoples' relationships with their individual and collective history. Sarah Kunaknana related the following experience while testifying at the scoping meeting held for Sale BF in Nuiqsut in 1979:

> *My name is Sarah Kunakanna and I have lived in this area since 1921. Our family stayed at Prudhoe Bay until late 1930's. Our old sod house is still standing today. When I visited last summer, I saw the pingos we used for duck blinds was a burning pit. Our place is a barge landing place instead of a fishing camp site. I guess people that are aware of Prudhoe Bay know that old shack on the east dock. That's where her house is still in position. That's the one she's talking about. There are a lot of old sites, camping sites, fishing sites along the line. They are there and are being threatened by development.*

The most intense oil and gas development activity occurred during the 1970s and early 1980s (e.g., development of the Prudhoe Bay and Kuparuk oil fields, construction of TAPS and the haul road, and construction of a large portion of the roads, drilling pads, gravel sources, collector pipelines, and production facilities). These developments occurred following the passage of the NHPA (1966) and NEPA (1969). These laws mandated the identification of cultural resources potentially affected by developments and mitigation of the impacts. In addition, these developments resulted in the discovery of many previously undocumented cultural resources. In part, increased oil and gas exploration and development activity prompted the NSB to initiate the Traditional Land Use Inventory (NSB Contract Staff 1979; Schneider and Libbey 1979). In 1977 and 1978, an archaeological survey was conducted in selected areas of the National Petroleum Reserve – Alaska, as mandated by Congress under Public Law 94-258, the Naval Petroleum Reserves Production Act. This survey resulted in the identification of 728 cultural resource sites. The Archaeological Resources Protection Act of 1979 added additional protections for cultural resources on public or Native-owned lands. In addition, the Native American Graves Protection and Repatriation Act of 1990 provided protection for Native human remains, sacred objects, and associated funerary objects on federal and Native-owned lands.

Summary of Past Effects and Their Accumulation

Effects to cultural resources from road and pad construction and gravel mining, and disturbance associated with development and production activities have occurred in the past and persist today. Gravel roads, gravel pads, and gravel mines have caused surface disturbances that could have impacted cultural resources. Over 500 acres of peat roads were constructed, and gravel footprints have impacted over 9,200 acres. Gravel mines have impacted another 6,360 acres of vegetation, with over 5,000 acres of gravel being mined in rivers, where cultural resources are often found.

The above factors illustrate an improvement in the identification of cultural resources prior to ground-disturbing activities. Federal regulations and management stipulations regarding cultural resources were developed to mitigate impacts to cultural resources. However, increased development and exploration activities, while prompting the identification of the majority of cultural resources in National Petroleum Reserve – Alaska and the North Slope, have increased the cumulative effects to these resources.

Future Effects and Their Accumulation

Cultural resources are distributed unevenly across the North Slope. Areas with high probabilities of prehistoric and historic use are generally predictable, but specific subsurface cultural resources are often unknown until some sort

of disturbance occurs, making it difficult to assess the cumulative impacts to cultural resources. The more oil and gas associated activities that occur, the larger the area affected and the greater the possibility that cultural resources would be impacted.

Increased oil and gas development activities on the North Slope would result in an increased need for gravel for infrastructure construction. The excavation of up to 1,000 acres of gravel during the next 50 years for well pads, roads, and airstrips could impact cultural resources. Most prehistoric and historic sites are located on well-drained ground, and on the North Slope, well-drained ground equates with gravel deposits, which are not common in the northern portion of the National Petroleum Reserve – Alaska. As a result, a gravel deposit with some degree of surface exposure would likely be associated with a cultural resource site. Therefore, the more gravel deposits excavated for the construction of permanent facilities associated with development, the higher chance that impacts to cultural resources would occur. Depending on the degree of development, gravel extraction could be as small as the amount needed to expand existing pads at Inigok, Puviaq, and Point Lonely, or as large as the amount needed to build roads connecting pads and airfields back to the infrastructure at the Alpine field.

Because of their surface or near-surface stratigraphic contexts, cultural resources are not well protected by soil and vegetation, and are vulnerable to any surface or subsurface-disturbing activity. Exploration would be more likely to affect cultural resources than development activities, because basic exploration activities, such as seismic work, ice road and pad construction, and overland travel affect a much greater surface area than the construction associated with development. Although snow cover and frozen ground may offer some protection to cultural deposits, they also cover the surface, making cultural resources difficult to recognize and avoid. In addition, most exploration-related operations occur in the low light conditions of winter; therefore, surveys of proposed activity areas and overland travel routes during the snow-free months preceding the initiation of winter exploration activities are important.

The effects of a large terrestrial oil spill on a cultural deposit would be directly related to the time of year and the context of the resource. If the spill occurred during late spring and early fall, then there would be a higher potential for an effect on cultural resources. Cultural resources could be contaminated by oil, making radiocarbon and other elemental assays valueless. However, the majority of effects would occur as the result of the cleanup rather than from the actual spill. During the winter months, both a spill and the resulting cleanup would have considerably less effects on surface and subsurface cultural resources, although warm oil could melt the snow and permafrost, damaging any underlying cultural resources. Hydrocarbon contamination could reduce the possibility that radiocarbon dating techniques could be reliably applied to affected material, making the dating of any recovered material problematic and increasing the cost of preserving and storing any such artifacts.

In general, impacts to cultural resources from future events would accumulate with effects that occurred in the past. Increased oil and gas exploration and development activities would increase the potential of impacting cultural resources. However, federal regulations and management policies are likely to remain in effect and would continue to allow for the identification of cultural resources and mitigation of impacts prior to ground-disturbing activities.

Global Climate Change

Climate change could cause changes to the environment and habitats of the North Slope that could seriously affect cultural resources and the people who value them (ACIA 2004). Climate changes could result in changes to vegetation coverage and type and the physical structure of the landscape itself (ACIA 2004). The thawing of permanently frozen ground could result in the erosion of river banks and beach bluffs, which would result in the destruction of known and undocumented historic sites as artifacts and sites were washed away. In addition, the thawing of permanently frozen ground could result in decreased preservation of subsurface cultural materials; natural processes, such as erosion, have exposed most known cultural deposits on the North Slope, particularly in areas with little or no organic soil and sparse vegetation. In most cases, this type of natural impact is viewed as positive rather than negative, as it reveals the presence of sites and usually generates few substantial effects. The action of flowing water, seasonal freezing and thawing (cryoturbation), thermokarsting, pingo and patterned earth formation, and solifluction can reveal cultural deposits, but can also cause minor impacts to cultural resources.

Aggrading and eroding shorelines along the Beaufort Sea coast and in the barrier islands have likely exposed or destroyed a large number of sites in areas too remote for archaeological recordation, such as Thetis Island. Increased maritime activity along the coastal areas, in waterways, and in lakes could result in increased erosion due to boat wakes, exposing and possibly destroying coastal and riverine cultural resources.

Contribution of Amendment Alternatives to Cumulative Effects

The greatest potential for cumulative effects would occur under Alternative C, as the entire Planning Area would be available for leasing, and the amount of development proposed under this alternative is greater than for the other alternatives. The potential for cumulative effects under Alternative B and the final Preferred Alternative would be similar. Although much of the northeastern portion of the Planning Area would be closed to leasing under Alternative B, the amount of development proposed under this alternative would be about 20 percent greater than for the final Preferred Alternative. Teshekpuk Lake would be deferred from leasing under the final Preferred Alternative, but the likelihood of a large number of cultural resources being found in the lake would be small. However, NSO restrictions on permanent facilities in caribou habitat protection areas and the Goose Molting Area would limit the amount of surface disturbance that could occur north and east of Teshekpuk Lake; these restrictions would reduce the likelihood of cumulative effects to cultural resources. Under the No Action Alternative, 600,000 acres associated with Teshekpuk Lake Special Area would be closed to leasing. In addition, further lease sales and exploration and development in the South and Northwest portions of the National Petroleum Reserve – Alaska, and areas outside (e.g., Point Thomson), would increase the potential area of effects. While oil and gas exploration and development are the primary contributors of cumulative effects to cultural resources on the North Slope, other contributing factors include permitted activities, such as scientific data gathering, recreational use by the public, and activities ancillary to the BLM's management of the area. These non-oil and gas related activities are likely to result in indirect impacts. Activities outside the Planning Area would not be expected to have any impact on cultural resources within the Planning Area; however, the effects on cultural resources across the North Slope over time would be additive.

Lease stipulations and ROPs developed for the 1998 Northeast IAP/EIS ROD and this amendment would reduce the likelihood of oil and gas exploration and development activities impacting cultural resources. These include actions that require operators use low-ground-pressure vehicles and cease operations when the spring melt of snow begins; prohibit exploratory drilling near any known, long-term cabin or campsite; require setbacks along rivers, streams, lakes, cabins, and the coast, providing additional protection for cultural resources and traditional/cultural land use areas; minimize cultural and resource conflicts through an orientation program for personnel that would include instruction on the importance of not disturbing archaeological resources and sensitivity to community values, customs, and lifestyles; require an inventory of known traditional land use sites (NSB TLUI sites; see Appendix I) prior to any field activity so that these sites can be avoided and any damage from field activities can be mitigated; and require a cultural resources survey prior to any ground disturbing activity. If cultural resources are identified during surveys, BLM guidelines and policy require that all potential effects to the resources be mitigated to the satisfaction of the land manager.

Conclusion

Cultural resources are nonrenewable, and displacement or contamination of cultural resources could affect the cultural and scientific values of the resource. The cumulative effects of oil and gas exploration and development within the Planning Area and across the North Slope are difficult to estimate given the scattered nature of cultural resource deposits, their surface or near-surface contexts, and difficulty in predicting their location. As long as surveys and inventories were completed prior to exploration and development, the effects on cultural resources would be minimized. The accidental discovery or damage to sites, presently known or unknown, would to some extent damage those sites, but would also require measures to recover or record the remaining material, adding that information to the archaeological record of the North Slope.

The NHPA requires agencies, or their permittees, to complete a cultural resources survey before any undertaking occurs (i.e., a ground-disturbing activity, such as well drilling, construction of infrastructure or the construction of buried pipelines) on federal lands. The BLM's guidelines and policies require that all effects to any cultural

resources identified during surveys must be mitigated to the satisfaction of the land manager and the SHPO. Lease stipulations and ROPs developed for the action alternatives would minimize or prohibit exploration and development activities near major rivers, reducing the likelihood of impacts to cultural resources.

4.7.7.12 Subsistence

The Iñupiat people of the North Slope of Alaska have created, over the span of their history, a set of tools, behaviors, and cultural values that enabled them not merely to survive, but to thrive and expand into much of the Arctic, from Greenland to Siberia. Only in the last 180 years has contact with Euroamericans gone from seasonal trading to long-term occupation, and only in the last 60 years have semi-nomadic Iñupiat settled into sedentary villages and been subjected to managed hunts and the cultural pressure of Euroamerican dominance of commerce, government, and media. The central conflict for the Iñupiat on the North Slope, since the beginning of prolonged contact with Euroamericans, has been the use and control of lands, competition for renewable resources, and the efforts by Euroamericans to impose changes in the culture, lifeways, and behavior of the Iñupiat through regulation. Since the mid-19th century, the Iñupiat have adapted to external pressures (e.g., commercial whaling, trapping, reindeer herding, military construction, oil and gas exploration and development) and regulatory actions (e.g., state and federal regulations and International Whaling Commission quotas; see sections 3.4.2.3 [Traditional Iñupiat Settlement Patterns and Subsistence Use Areas] and Appendix J.5 [Traditional Iñupiat Settlement Patterns and Subsistence Use Areas]). The following discussion addresses key events (past, present, and reasonably foreseeable future) and the impacts that these key events have had on subsistence activities over time and could have in the future. Despite the past pressures for change, what remains constant is the value of maintaining a relationship with the land and resources of their forefathers through hunting and gathering activities and associated kinship and sharing, reinforcing the importance of subsistence to the Iñupiat people of the North Slope.

Past Effects and Their Accumulation

Prior to sustained contact between the Iñupiat of the North Slope and Euroamericans, the Iñupiat were a highly mobile, geographically widespread, and technologically capable people who lived in dispersed, small communities based on family and social connections. They harvested local resources as needed and as available, with large numbers of people aggregating at certain points along the edges of the sea ice for the harvest of bowhead whales on their spring and fall migrations (see Section J.5). Once a sufficient number of whales were harvested, they held a giant festival and feast, dividing whale products among participants, and then dispersed throughout the landscape again. This pattern continued into the 19th century, with intermittent contact with Russian, American, British, and Norwegian traders, explorers, missionaries, and government representatives. This contact intensified when commercial whaling north of the Bering Strait began in the 1850s (see Appendix J.5).

With the advent of commercial whaling in the Pacific Ocean, European and American whaling ships worked further north, passing through the Aleutians in the mid-19th century, sparking a large number of independent people and companies harvesting marine mammal resources in the area. Commercial whaling north of Bering Strait lasted approximately 60 years, and introduced a number of impacts to the people and resources of the North Slope. Among these impacts were disease, the introduction of new foodstuffs, including flour, sugar, coffee, and tea, the increased availability of alcohol and tobacco, ongoing efforts at acculturation of the Iñupiat through missions and government schools, and efforts to centralize and make sedentary the highly mobile populations of Iñupiat. The failure of commercial whaling by 1910 coincided with a depletion in the number of whales available for harvest, making the ongoing subsistence harvest difficult for the Iñupiat remaining along the Arctic coast. Further complicating subsistence whale harvest was a decrease in the Iñupiat population due to disease, accidents, and poor health care. Iñupiat and whale populations gradually recovered during the 20th century. Following a reduced presence of Euroamericans in the beginning of the 20th century, due to the collapse of commercial whaling, the Iñupiat returned to their highly dispersed way of life, with additional emphasis on fur trapping and reindeer herding as a source of money to buy those Euroamerican goods they desired.

In the 1920s, the establishment of the Naval Petroleum Reserve and subsequent exploration activity marked the beginning of resource extraction activity in lands occupied by the Iñupiat of the North Slope. World War II

increased the need for oil for naval vessels and industry, and began a period of intensified exploration and drilling activity on the North Slope. Lucy Ahvakana described her experiences during this period in scoping testimony for Lease Sale 170 in 1997:

> *When I was married to my first husband, we had a trading post in Foggy Island and Beach Pine, my first husband and I. We always go back and forth, trade, foxes, furnishing the food for Eskimos. Trappers live here. All of us -- a lot of us didn't get a chance to go to school. No school up here. You -- BIA didn't have enough money to put a school up here. They were trying to. And then we heard this oil company is coming. I moved to Barrow and these expeditions -- these looking for oil, Navys came. We went to Barrow. My husband said I had to go to Barrow to get my kids to school. So when we went there, we saw a bunch of barges. I thought it was Japanese invaded the Barrow. We were scared. And my stepdad went to shore. They seemed peaceful. We asked them, "What's going on?" The Navy's up here. They are looking for oil 1945. There were eleven barges. I know that Captain John Bablin, Sr., was the navigator for them. I moved to Barrow at that time.*

Ms. Ahvakana's testimony continued to describe an indigenous person's view of the changes brought by the introduction of oil and gas exploration and development to a remote and technologically isolated population. The Bureau of Indian Affairs was responsible for educating and promoting the welfare of the Iñupiat people, as well as building a hospital and a school in Barrow. By 1950, the Bureau of Indian Affairs was requiring families with school age children to relocate to population centers (e.g., Barrow) so that the children could attend school. Construction of a hospital and churches at Barrow also encouraged North Slope residents to settle there. Children were sent outside to boarding schools, including Chemawa in Oregon and Mt. Edgecumbe in Sitka. The children that returned from these boarding schools often became spokespeople for the community and interposed themselves between the forces of development and the conservation of traditional ways of life. Some Iñupiat returned to traditional harvest areas seasonally, and in the early 1970s, following the passage of ANCSA, many traditional use areas were permanently resettled (e.g., Nuiqsut and Atqasuk). The events of this time period caused the formation of administrative offices (e.g., Alaska Federation of Natives, NSB).

During the mid-20th century, the Department of Defense contracted for the construction of DEW-line and WACS sites on the North Slope as part of a pan-Arctic curtain of radar coverage and communications systems that spread from Greenland to the Aleutians. North Slope residents were no longer allowed to hunt near these locations, all of which were situated at or near important subsistence or residence sites. Barter Island, the site of a trading fair and several camps, drew Iñupiat people to settle there for jobs, though the site was built on the remains of several historic houses and graves. Operation of these sites by the military, and later contractors, resulted in contamination of the surrounding area with fuel, oil, antifreeze, and other chemicals, which led to avoidance of these areas by subsistence harvesters concerned about chemical contamination.

Postwar oil exploration and the sustained contact with Euroamericans, brought by activities associated with oil and the Cold War, resulted in additive impacts on subsistence resources, harvest patterns, and users. The establishment and enforcement of state and federal game regulations affected harvest activities and patterns (e.g., 1961 duck harvest protests in Barrow). These events encouraged the development of indigenous means of countering regulatory efforts dictated from outside the region and gave some voice to the Iñupiat people in defending their interests and promoting their causes (e.g., Alaska Federation of Natives in 1967 and Alaska Eskimo Whaling Commission in 1977). Out of these conflicts arose the first calls for scientific research into the peoples and lifeways of the Arctic, often based from facilities built by the military, such as the Naval Arctic Research Laboratory (NARL). Leasing of the offshore continental shelf areas for oil and gas exploration required further study, including study into the use of subsistence resources. These events also contributed to the organization of the communities in order to effectively address the issues brought up by development pressure, and to defend the rights of the Iñupiat people to maintain their way of life while incorporating the aspects of Euroamerican technology and culture that they found valuable. According to Worl, writing in one of the early research repots of contemporary subsistence uses by Iñupiat people, the "fate of subsistence lies not so much at the level of the hunter

pursuing his game, but rather at the level of external pressures impacting his environment and regulatory actions that restrict his subsistence pursuits" (NSB 1980).

The most intense oil and gas development activity, and increased impacts to subsistence activities, occurred during the 1970s and early 1980s (e.g., development of the Prudhoe Bay and Kuparuk oil fields, construction of TAPS and the haul road, and construction of a large portion of the roads, drilling pads, gravel sources, collector pipelines, and production facilities). In part, increased oil and gas exploration and development activity prompted the NSB to initiate the TLUI (NSB 1980), a repository for information on historic sites and present land use (e.g., hunting camps and cabins). Oil and gas development in the Prudhoe Bay and Kuparuk areas discouraged Nuiqsut residents from using the eastern portions of their traditional harvest areas (see Appendix J, Section J.10.4 [Nuiqsut Contemporary Subsistence Use Areas] and maps J-7 through J-13). Additionally, bowhead whaling quotas instituted by the International Whaling Commission resulted in the establishment of the Alaska Eskimo Whaling Commission.

Over the last 30 years, the Iñupiat have participated in public hearings for various industrial activities (e.g., lease sales, project scoping). During these hearings, the Iñupiat have consistently stated that they are concerned about the cumulative effects of industrial activities in their traditional subsistence use areas. They have noted the decline of fish populations caused by seismic activities, the diversion of caribou from traditional migration routes and calving areas caused by an increased number of low flying aircraft, the disruption of caribou movements by low pipelines, the ending of use of traditional harvest areas due to the avoidance of industrial areas by hunters, and the fear of the consequences of oil spills on subsistence resources. The specific experience of oil spills in the ocean were described by several elders due to the extent of the damage caused by an incident in the 1940s; described below is Thomas Brower's testimony for the 1975 Beaufort Sea hearings in Barrow:

> ...I'm touching on this because of the fact that in 1944 or 45 when the Navy first came into this area, one of their tankers hit the bottom of the ocean, north of the point here, and they pumped 25,000 gallons of crude oil into the ocean; and as that thing scummed the ocean and started drifting toward these islands that you are talking about; it just hung in wide strips, some 40 to 50 feet wide along the edges of those islands. And all the ducks that came near it and the fur-bearing animals or the mammals (like the seal) went through it were soon blinded and thousands of them perished and I just don't know what happen to the fish that passed through those areas, but I'm pretty sure many of them died too.

This experience became the model for concerns about threats to subsistence species and continued use of these resources by Iñupiat people as oil development rapidly spread west from Prudhoe Bay. Some residents were profoundly concerned about impacts to marine resources, and so opposed any oil development in the marine environment. In the meantime, development on land proceeded to the area immediately east of Nuiqsut, raising concerns about continued subsistence access in the early 1980s. Bessie Ericklook noted in testimony at the 1979 Sale BF hearings her concerns about subsistence access to the east side of the Colville River and the effects of oil development on subsistence species:

> Trapping was abundant east of here. Now, we don't go over because of the oil field. Just recently, it is known that the foxes are very dirty, discolored and rabid in that area. Trapping is done elsewhere. We used to see grizzly bears around. Now, they are not around. Where's the caribou now? One summer when we used to walk miles looking for caribou, came across two dead caribou for unknown reasons. The animals have faced a change. We have faced a change since activity began. If there is to be further activity, the fish and the sea mammals will suffer and we will suffer too. We depend on the fish, wildlife and the birds, still, today. Oil development poses a threat to our lifestyle.

Impacts to subsistence cased by the seismic exploration programs on the North Slope have also been observed for many years. Although seismic testing no longer uses dynamite on fish bearing lakes, Iñupiat blamed this activity for declines in fish numbers in the vast number of interconnected lakes and streams used by subsistence fishermen.

Arnold Brower, Jr. stated in scoping testimony for the 1998 Northeast IAP/EIS scoping meetings a consensus opinion among Iñupiat subsistence hunters that seismic testing, even in its current refined form, deflects subsistence animals from the areas it operates in:

> Thank you Harry, I think I've heard that concern now from two other persons that directly told me that the existing seismic is already impacting subsistence hunters as we speak, that the seismic area has no game. The impacts, like Harry said, has scared and run the game off in one direction from that area already and numerous trips made by at least half a dozen hunters have attested that, that they've gone from the east side of the Ikpikpuk and Chipp River to the west side, where they're not there in that seismic area anymore. So these people have purchased gasoline and planned their trips just to find out that the seismic is in that area already and went up to those areas of normal hunting and the game is not there.

Subsistence is currently, and has been since the mid-19th century, part of a rural economic system, called a "mixed, subsistence-market" economy, wherein families invest money into small-scale, efficient technologies to harvest wild foods (ADFG 2000). Important subsistence resources have varied in abundance and availability over time, due to environmental variation and human activities, especially commercial exploitation. Iñupiat adaptations to external pressures resulted in intensified use of specific resources (e.g., bowhead whales, caribou, and furbearers) and a decline in the use of other species and resources (e.g. brant, goose and eider eggs, and long-tailed ducks). For muskox, reintroduced on the North Slope in the last 20th century, and moose, which expanded their range into the North Slope in the past half-century, regulatory restrictions have limited Iñupiat harvests. Over time, the Iñupiat experienced a growing reliance on an external market system to purchase introduced technological innovations to support subsistence activities (e.g., traps, boat motors, snowmachines). The constant advances in motorized transportation helped support the continued mixed economy and subsistence practices, partially mitigating the effects of concentrated populations and high levels of activity in particular areas by making travel faster and easier, although at greater cost in monetary resources. Avoidance of formerly utilized harvest areas due to industrial activity was made possible by motorized transportation, which allowed subsistence users to travel farther and faster than in the past. Increased institutionalization in response to increased industrial activity on the North Slope allowed increased Iñupiat autonomy and allowed the community to mitigate impacts with industry.

Cumulative effects from oil development are an important concern for North Slope residents. These concerns have been expressed in a number of different forums, including the 1998 Northeast IAP/EIS and Northwest IAP/EIS scoping meetings and hearings, scoping meetings for the *Alpine Satellite Development Plan EIS*, scoping meetings held for this amendment, and meetings held with North Slope residents in Anchorage, Nuiqsut, and Barrow during December 2003 and January 2004. Some of these concerns, as summarized in the *Alpine Satellite Development Plan EIS* (USDOI BLM 2004c), and brought up during public scoping meetings and other meetings with North Slope residents, are presented in Table 4-38.

Summary of Past Effects and Their Accumulation

Prior to sustained contact between the Iñupiat of the North Slope and Euroamericans, the Iñupiat were a highly mobile, geographically widespread, and technologically capable people who lived in dispersed, small communities based on family and social connections. They harvested local resources as needed and as available. Beginning with commercial whaling in the 1850s, and followed by establishment of the Naval Petroleum Reserve and subsequent exploration activity that marked the beginning of resource extraction activity in lands occupied by the Iñupiat of the North Slope, the Iñupiat have had adapt to the "external pressures impacting his environment and regulatory actions that restrict his subsistence pursuits." Subsistence is currently, and has been since the mid-19th century, part of a rural economic system, called a "mixed, subsistence-market" economy, wherein families invest money into small-scale, efficient technologies to harvest wild foods. Over time, the Iñupiat experienced a growing reliance on an external market system to purchase introduced technological innovations to support subsistence activities (e.g., traps, boat motors, snowmachines). Avoidance of formerly utilized harvest areas due to industrial activity was made possible by motorized transportation. During this 150-year period, the Iñupiat have had to continually adapt to the constraints placed upon their subsistence activities and lifestyle by cultures other than their own. The effects

of these constraints on the Iñupiat persist today and will accumulate with future effects on their subsistence resources and lifestyle.

Future Effects and Their Accumulation

Oil and gas development and leasing are likely to increase as compared to current conditions. Leasing and subsequent exploration and development are likely to occur not only in the Northeast, but also in the South, Northwest, and outside areas (e.g. Point Thompson and ANWR) of the National Petroleum Reserve – Alaska (see Table 4-32 for reasonably foreseeable oil and gas development). Planned development in the Planning Area would nearly encircle the community of Nuiqsut, making it necessary for subsistence hunters traveling in nearly every direction to pass through some kind of development en route to subsistence harvest areas. As noted in public testimony for this amendment, Iñupiat hunters are particularly reluctant to use firearms near oil production facilities, roads, and pipelines, so they would be unlikely to harvest subsistence resources in these areas even if leaseholders did not object to harvester access. Subsistence users currently avoid the Kuparuk and Meltwater areas because of the physical barriers that pipelines and elevated gravel roads pose to winter snowmachine travel, and subsistence users have expressed concerns about hunting close to oil production and processing facilities, because of perceived regulatory barriers (Ahtuangaruak 2001). Development near Fish and Judy creeks and Kogru and Kalikpik rivers could interfere with access to areas where half of Nuiqsut's subsistence fish and caribou harvests take place (USDOI BLM MMS 2003). Development along the north side of Teshekpuk Lake, outside the areas currently closed to leasing, could deflect or divert caribou hunted in that area by Barrow, Atqasuk, and Nuiqsut residents (SRBA 2003b).

Differing views are emerging on the North Slope regarding the effects of roads on subsistence. For example, some North Slope residents believe that roads could mitigate impacts on subsistence harvests from industry, could improve access to areas of the traditional subsistence range at times of the year when access would be difficult, would shift subsistence harvests to areas that are currently less utilized, and could change the mindset that has caused local subsistence users to avoid industry infrastructure. In addition, roads between Nuiqsut and infrastructure would allow Nuiqsut residents to live in town while employed by the oil industry, thus allowing the worker to spend time with family and continue to harvest subsistence resources. On the other hand, roads could have a detrimental effect on traditional patterns of subsistence harvests and resource availability. For example, a new road would increase access among Iñupiat and others to areas previously less utilized and would change the character of that area and could deflect subsistence resources and interfere with nesting waterfowl. Additionally, roads that increase access would result in increased competition between users (both local and non-local).

Oil production facilities operating in subsistence use areas could result in the contamination of subsistence foods, particularly fish, caribou, and marine mammals. Seismic exploration, exploratory drilling, and overland moves in the winter would continue to affect wolf and wolverine harvests. In the past, hunters observed these animals avoiding industrial activity areas, thus reducing their availability to Nuiqsut and Barrow hunters (Brower 1997). Harvest in these areas would require increased effort, risk, and cost on the part of subsistence users who pursue these animals for traditional clothing and crafts, as well as trade and sale of the hides. Oil production facilities operating in subsistence use areas could cause the contamination of, or perceived contamination of, subsistence foods, particularly fish, caribou, and marine mammals. The numbers of foxes, brown bears, seagulls, and jaegers could increase, as these scavengers are habituated to human activities and food, and their predation on nesting waterfowl could increase as well (Burgess 2000). This increased predation on nesting birds, eggs, and fledglings could result in local resource declines.

In the past, oil and gas activities have deterred subsistence users from using their traditional subsistence use areas. The continued expansion of this activity across the ACP from Prudhoe Bay westward could increase the area considered off-limits by resource users, deflect or divert important subsistence resources from their normal routes, and require users to travel farther to harvest subsistence foods (IAI 1990a). The continued increase in developed

Table 4-38. Summary of Traditional Knowledge/Local Knowledge.

Resource Category	Summary of Effects and Locations	Testifier
Physical Characteristics		
Aquatic Environment (water resources; surface water; estuarine waters and water quality; marine water quality; flooding regime; and ice conditions.)	*Comment*: As a result of past action the Itkillik River, which was once clear, is now a rusty color. *Effects*: Decreased water quality and a lack of fish in the Itkillik River, and less fish for subsistence use. *Area*: Itkillikpatt and the Itkillik River.	Bessie Ericklook, 1979 Beaufort Sea Lease Sale, public hearing in Nuiqsut.
	Comment: Fresh water river levels near Nuiqsut are decreasing and rivers are getting shallower and shallower each year. *Effects*: Lower fish population and less fish for subsistence use. *Area*: Nuiqsut and surrounding rivers.	Flora Ipalook, 1979 Beaufort Sea Lease Sale, public hearing in Nuiqsut.
	Comments: Loss of 2 to 3 feet of water in area lakes especially Shinmar Rock; level went down to 5 to 6 feet and therefore it cannot support any more fish. *Effects*: Less fish present due to decrease in water levels and increase in noise, and less fish for subsistence use. *Area*: Shinmar Rock.	Arnold Brower, Sr., 1976 Federal Energy Hearings, public hearing in Barrow.
	Comment: Lakes and rivers are shallower than in past. Streams and rivers that shoot off of Tsukpuk Lake use to be navigable by boat but they can't even go on them. *Effects*: Decreased access; reduced fish populations; less fish available for subsistence use; and less available area for hunting and fishing. *Area*: Tsukpuk (Teshekpuk Lake).	Daniel Leavitt, 1979 Beaufort Sea Lease Sale, public hearing in Barrow.
	Comment: All drilling operations consume a lot of water. The same thing will happen to the Sagavanirktok like it did to the Sagavanirktok River; it ran completely dry twice in 1 year. *Effects*: Less animals and fish in area. *Area*: Sagavanirktok River.	Raymond Neakok, 1982 National Petroleum Reserve – Alaska, subsistence hearing in Barrow.
	Comment: A combination of built up ice and snow drifts and water rising with the tide causes area flooding. *Effects*: Flooding to 12 miles up river causes danger for those with a dog team or on snowmachine, and less accessible area. *Area*: Howuerenokto and Ocean Point.	Nuiqsut Whaling Captains Meeting, 1996 Northstar EIS Project.
Atmospheric Environment (climate and meteorology; air quality; and existing ambient air quality)	*Comment*: High winds and larger than average swells. *Effects*: Increase in swells, which inhibited ability to travel to and from subsistence area. A decrease in subsistence due to decrease in safe travel. *Area*: Cross Island.	Archie Ahkiviana, 2001 Liberty Project, public hearing in Nuiqsut.

Table 4-38. Summary of Traditional Knowledge/Local Knowledge (Cont.)

Resource Category	Summary of Effects and Locations	Testifier
Atmospheric Environment (Cont.)	*Comments*: She (former health aid and physicians assistant) has noticed an overwhelming increase in asthma patients. The village makeup has not changed, still mostly Inupiaq. The most overwhelming issue was that the oil development around the gas community had increased and gotten closer. The worst nights were nights with many natural gas flares, as they release particles and some infiltrate the ground. We are seeing changes in the caribou and fish leaving them with lesions and tumors. Helicopter activity has diverted caribou away from us during hunting/subsistence gathering. *Effects*: Burning of natural gas and petroleum products has increased risk for respiratory problems in local residents. Increase in noise due to air traffic spooks caribou herd thus decreasing amount present in area. Infiltration of particles has caused disease in animals. *Area*: Nuiqsut and immediate surrounding areas.	Rosemary Ahtuangaruak, Mayor, 2003 Alpine Slope Development Plan, public hearing in Nuiqsut.
Biological Resources		
Fish	*Comments*: Use of explosives has killed or damaged many fish under the ice (traditional methods of harvesting involved using a hammer to strike the ice creating a noise killing the fish). *Effects*: Smaller fish population due to increase in noise and less fish for subsistence use. *Area*: Finmore Rock, Sitkulik and the Tripp River area.	Arnold Brower, Sr., 1976 Federal Energy Hearings, public hearing in Barrow.
	Comment: Use of explosives and compressors, especially in the winter months, has killed off or caused the relocation of those fish in local rivers and lakes. A method used by his father to gather fish involving pounding on ice to kill fish then drilling an opening downstream to gather the fish is no longer a feasible means of collection for him. Lakes where the fish are inland freeze over in the winter and they die due to lack of water. A compressor which sends off a very loud noise and vibrations can also kill a lot of fish. *Effects*: Decreasing fish population. They are no longer able to use methods passed down through generations for harvesting fish. *Area*: Rivers in the area between Barrow/Nuiqsut to Anaktuvuk Pass.	Joash Tukle, 1982 National Petroleum Reserve – Alaska, subsistence hearing in Barrow.

Table 4-38. Summary of Traditional Knowledge/Local Knowledge (Cont.).

Resource Category	Summary of Effects and Locations	Testifier
Fish (Cont.)	*Comments*: We had some good fishing grounds up there and this fall we hardly even caught any. After the PET-4 seismograph party went through the depth of the lake is a little over 8 feet and a few blasts would clean the whole thing up. Traditional methods of hitting the ice then harvesting them out of the river downstream proved ineffective. *Effects*: Fish were not present following blasting and seismic activity and indirect effects as less fish available for subsistence use. *Area*: Area not specified.	Charlie Edwardson, 1976 Federal Energy Hearings, public hearing in Barrow.
	Comment: In an area where drilling had occurred, a net was placed in the lagoon near the ocean where my dad use to catch Arctic char. Even though we had the net there overnight we did not catch any fish. *Effects*: Fish population has declined in areas where drilling has occurred and less fish available for subsistence use. *Area*: Prudhoe Bay.	Jenny Ahkivgak (Okkingak), 1982 National Petroleum Reserve – Alaska, subsistence hearing in Barrow.
	Comments: Markers of the sounders that had been placed near the river. From that time on, the fishes in that river changed and are not there anymore right now. Sounders are killing them or driving them to the bottom of the stream. *Effects*: Fish were not present following sounding and less fish for subsistence use. *Area*: Area not specified.	Noah Itta, 1982 National Petroleum Reserve – Alaska, subsistence hearing in Barrow.
	Comments: Since the use of dynamite in the river, there have been fewer and sometimes no fish found. They also disturbed the garden where they live off of. *Effects*: Fish not present after blasting events (up to 3 years after) and less fish available for subsistence use. *Area*: Area not specified.	Noah Itta, 2001 Liberty Development and Production Plan, public meeting in Nuiqsut.
	Comment: Fished in the Fish Creek area for Arctic cisco with mother (2 generations), since start of Alpine few years ago, hardly any fish to be caught in same area. *Effects*: Less fish in Fish Creek area. An indirect effect is less fish available for subsistence use. Area: Fish Creek, Nuiqsut, and surrounding areas.	Jimmy Nukapigak, 2003 Alpine Satellite Development Plan, public hearing in Barrow.

Table 4-38. Summary of Traditional Knowledge/Local Knowledge (Cont.).

Resource Category	Summary of Effects and Locations	Testifier
Fish (Cont.)	*Comments*: CD-6 is close to Fish Creek area where they fish in the summer. When they can't get fish in the Nigliq Channel they slide over to the other channel. It has lots of fish and they taste better than Colville fish. *Effect*: Putting in CD-6 could possibly disturb area and effect population of fish in the area historically and currently used for fishing. *Area*: Around proposed CD-6 and Nigliq Channel area.	Frank Long, Jr. 2003 Alpine Satellite Development Plan, public hearing in Nuiqsut.
Birds	*Comments*: In Inigok where a lot of drilling took place, bones were seen from birds that have been killed from the stuff they leave behind in the hole. Wildlife and waterfowl dying from contaminants being left after having conducted drilling activity. *Effect*: Contamination of waterfowl and wildlife resulting in death and steady decrease in migratory bird population. *Area*: Upulatook near Nuiqsut; Inigok.	Thomas Brower, Jr. and James Aiken, Sr., 1997 1998 Northeast IAP/EIS, scoping meeting in Atqasuk.
	Comment: There's a lot of activity out there, and occasionally we have mortality events in either fish, caribou or waterfowl, and these essentially go unaddressed. *Effect*: Increased mortality likely associated with increased development and human activity. *Area*: Area not specified.	Todd O'Hara, 2003 Amended IAP/EIS, scoping meeting in Barrow.
Mammals (terrestrial and marine mammals)	*Comments*: Seismic activity is displacing the animals. While hunting wolverines, which were being tracked, they had just been scared away from where activity (seismic) was occurring. There are no furbearers except for the foxes; did not see wolverines. *Effects*: Normal movement of animals is affected by activity making hunting and tracking more difficult and decreasing the number of available wolves and foxes for subsistence use. *Area*: Southside of Teshekpuk up in Pikes dunes and up the Ikpikpuk River.	Harry Brower, Jr., 1997 1998 Northeast IAP/EIS, scoping meeting in Barrow.
Social Systems		
Economy	*Comments*: Being a 3rd generation since pre-contact of Western civilization, they are faced with the fact they must either subsist off the land or take a 9:00-5:00 job. Cannot totally exist on subsistence anymore. *Effects*: Lifestyle drastically different than the way of their forefathers. Can no longer subsist off of the land and must work for the oil companies. Most are not qualified and jobs are short lived. *Area*: Barrow.	Sheldon Bogenrifle, 1982 National Petroleum Reserve – Alaska, subsistence hearing in Barrow.

Table 4-38. Summary of Traditional Knowledge/Local Knowledge (Cont.).

Resource Category	Summary of Effects and Locations	Testifier
Economy (Cont.)	*Comments*: Qualifications have changed for those natives who desire to work for oil related companies. In the beginning, the only qualification was that you pass the UA, now to get a regular labor job or driving job you need a clean UA, a driver's license or a CDL, unrestricted, and NSTC card. *Effects*: Fewer are qualified or eligible for employment through the oil industry. Less available money for those living in the villages without qualifications (who are no longer able to completely subsist). *Area*: Village of Nuiqsut.	Bernice Kaigelak, 2003 Alpine Satellite Development Plan, public hearing in Nuiqsut.
	Comment: We face the highest unemployment rates today, even though we can see the Alpine oil field just 7 miles away from Nuiqsut. *Effect*: Limited economic benefits to local communities as a result of development nearby. *Area*: Area not specified.	Isaac Nukapigak, 2003 Amended IAP/EIS, scoping meeting in Nuiqsut.
Subsistence Harvest and Uses	*Comments*: The continuous development from the east going west has heavily impacted some of their hunting grounds. She is also very concerned of future development because more infrastructures are being placed, which will divert our hunting grounds, make our hunting game that much further out to try to harvest. *Effect*: Reduction in subsistence harvest opportunities. Longer distance and increased effort required to obtain harvests. *Area*: Area not specified.	Annie Lampe, 2003 Amended IAP/EIS, scoping meeting in Nuiqsut.
	Comments: We're going further and further inland to hunt caribou, but when they do come around our area, it's a blessing and a curse because a lot of these animals are sick. And then when you don't catch what you need, you have to rely on the income that comes in. *Effects*: Increased effort required to obtain harvests. Decrease in the quality of local harvests. *Area*: Area not specified.	Big Bob, 2003 Amended IAP/EIS, scoping meeting in Barrow.
	Comments: The residents of our communities rely upon these resources for the sustenance of our families. The cost of obtaining western staples is often out of reach of many families. The health of our community is dependent upon our resources. Any activity that causes changes to our harvesting of the subsistence resources will impact upon our families. The sharing of our resources with our extended families ripples down with losses for them also. *Effects*: Reduced community health. Effects beyond the hunters themselves. *Area*: Area not specified.	Rosemary Ahntuangaruak, 2003 Amended IAP/EIS, scoping meeting in Nuiqsut.

Table 4-38. Summary of Traditional Knowledge/Local Knowledge (Cont.).

Resource Category	Summary of Effects and Locations	Testifier
Land Uses and Coastal Management (land ownership; land use; coastal management; and the NSB Land Management Program)	*Comments*: After catching a musk-ok he was taken to court for being inside the industry boundary. Must now fight in court for harvesting in certain areas. *Effects*: Freely hunted subsistence areas are now trespassing on oil company land in order to reach the same areas restrictions on land use. Less muskox due to land use/ownership restrictions. *Area*: Area not specified.	Arnold Brower, Jr., 1998 1998 Northeast IAP/EIS, public meeting in Atqasuk.
	Comment: Open areas are now impassable due to dynamite left behind and wires scattered over the area. *Effects*: Change in use of land and less land to subsist from. Smaller amounts of available animals for subsistence harvest. *Area*: Area not specified.	Ruth Nukapigak, 1979 Beaufort Sea Lease Sale BF, public hearing in Nuiqsut.
	Comment: Her grandparents had a sod house and a cellar in Prudhoe Bay; now, they are unable to even access the site. They have no right to it even though their ancestors were there before the oil fields were there. Effects: Loss of access and previously owned land to oil industry. Area: Unspecified; Unspecified; Prudhoe Bay.	Sarah Kunaknana.
Transportation (road systems; aviation systems; marine transportation systems; pipeline systems; ice roads and platforms; winter Rolligon travel; and Alaska Railroad Corporation)	*Comment*: In order to cross the pipeline sometimes it is necessary to travel up to 10 miles off course. *Effects*: Longer travel time; indirect effect-increase in disturbed area due to having to travel off previously disturbed paths. *Area*: Nuiqsut area.	Thomas Napageak, Leonard Lampe, and Arnold Brower, 1997 1998 Northeast IAP/EIS scoping meeting in Nuiqsut.
Hazardous Materials/ Environmental Justice	*Comment*: As witnessed and experienced when working for the oil companies, toxic muds and caustic sodas are being dumped into the rivers and oceans. Most of the abandoned oil rigs I have worked on, the toxic muds are put in good little cubes, about 5,000 square yards of toxic muds go uncovered. The wastes are accumulating. *Effects:* Accumulation of toxic materials and waste. Indirect effects as animals are exposed to these hazardous materials. *Area*: Unspecified.	Raymond Naekok, 1982 National Petroleum Reserve – Alaska, subsistence hearing in Barrow.

Table 4-38. Summary of Traditional Knowledge/Local Knowledge (Cont.).

Resource Category	Summary of Effects and Locations	Testifier
Hazardous Materials/ Environmental Justice (Cont.)	*Comment*: When he was a boy, in his hometown during the springtime oil companies would clean out their silt and place the oils outside. Birds would stick to the oil and become unable to fly, eventually dying. *Effects*: Birds dying from inability to escape from oil exposed to the environment. Less birds for hunting and subsistence. *Area*: Area not specified.	Laurie Kingik, 1982 National Petroleum Reserve – Alaska, subsistence hearing in Barrow.
	Comment: And these construction outfits, they bring in the old equipment, old run down—some of them older than I am, and when they break, the oil gushes out. It sprays all over. *Effects*: Release of oil to the environment. *Area*: Area not specified.	Big Bob, 2003 Amended IAP/EIS, scoping meeting in Barrow.
Caribou	*Comments*: Seismic testing involving dynamite is affecting caribou who consume the blasting powder; causes rabid behavior and effects on the animals. Caribou are affected by amount of waste materials. *Effects*: Poisonous powder used in blasting is being eaten by caribou thus decreasing well population and waste materials attaching to caribou (wires). Indirect effect is less healthy caribou for subsistence use. *Area*: Area not specified.	Raymond Neakok, 1982 National Petroleum Reserve – Alaska, subsistence hearing in Barrow.
	Comment: The pipeline from Oliktok to Kuparuk has caused the displacement of caribou from Cross Island to Teshekpuk. Few caribou have are crossing under pipelines and as a result there is displacement of caribou in the villages. *Effects*: Less caribou present following installation of pipeline. Less caribou available for subsistence use. *Area*: Oliktok to Kuparuk, from Cross Island to Teshekpuk.	Frederick Tuckle, Sr., 2001 Liberty Development and Production Plan, public hearing in Barrow.
	Comment: The 5 feet pipeline height had changed the caribou migration pattern due to past oil and gas developments. *Effects*: Disruption of caribou migration. Disruption of subsistence harvest and more effort required to harvest caribou. *Area*: Area not specified.	Isaac Nukapigak, 2003 Amended IAP/EIS, scoping meeting in Nuiqsut.

Table 4-38. Summary of Traditional Knowledge/Local Knowledge (Cont.).

Resource Category	Summary of Effects and Locations	Testifier
Noise	*Comment*: Not far from the Nuiqsut site they are conducting wildlife surveys by air and by foot creating an enormous amount of noise that upsets, disrupts, and displaces perhaps some of their only opportunity to go get their game, especially caribou in the area are scared and may run off because of these impediments that arrive are not natural. Hunters must go further to gather game. *Effects*: Fewer caribou present following activity and surveys; thus, fewer caribou available for subsistence use. *Area*: Colville River Delta to the east side by Ulumniak.	Ruth Nukapigak, 1998 1998 Northeast IAP/EIS, public hearing in Nuiqsut.
Visual/Aesthetic	*Comment:* Flames out on the project oil platforms are very close to the whaling base of Nuiqsut called Cook Island so concerns on the migration and impacts to whales exist. Flames spook both the whales and crews who are harvesting whales for subsistence. *Effects*: Fewer whales in the area due to flashing gas flares. Increases danger for subsistence hunters. *Area*: Cross Island	Leonard Lampe, 1996 Northstar EIS Project, Nuiqsut public scoping meeting.

area would reduce the amount of suitable lands available for Nuiqsut residents to harvest necessary subsistence resources away from oil and gas facilities. If permanent facilities were constructed in the Planning Area, Nuiqsut hunters could be compelled to travel very long distances to harvest subsistence resources at a greater cost in terms of time, fuel, wear and tear on people and equipment, and lost wages.

The International Whaling Commission sets the quota for the number of bowhead whales that Alaska Eskimos may harvest. This quota is based on both the biological status of the bowhead whale stock, as well as the documented Alaska Eskimo cultural and subsistence need for bowhead whales. It is likely that the International Whaling Commission would perceive increased industrialization of the National Petroleum Reserve – Alaska and rest of the North Slope, including development of coastal staging areas, heightened interest in adjacent offshore areas, and increased oil spill risks, as placing increased pressure on the endangered bowhead whale population. As industrialization proceeds along the Alaska North Slope, it will increase noise, vessel traffic, and the potential for an oil spill in the Beaufort Sea. In response to concerns that noise, vessel traffic, and the potential for a catastrophic oil spill poses a threat to the feeding grounds of the western Pacific gray whales, the International Whaling Commission has already passed a resolution that the onset of oil and gas development programs is of particular concern with regard to the survival of this population. Because the North Slope is the fall migration path and feeding grounds of the bowhead whale, it is likely that the International Whaling Commission would seriously consider the effects of industrialization on the bowhead whale population. Although the International Whaling Commission is unable to directly control industrial activities, they are able to control the Alaska Eskimo subsistence harvest quota and could reduce this quota as a means of protecting the species confronted with the effects of increased industrialization. If the International Whaling Commission considers the threat of industrialization large enough, it could reduce the Alaska bowhead whale quota to protect the stock. This quota reduction would have a serious subsistence and cultural effect on the Iñupiat communities of the North Slope as well as to the Iñupiat in other communities who receive whale meat from the harvest.

Global Climate Change

Changes to the environment and habitats of the North Slope resulting from climate change could seriously affect subsistence resources and resource users (ACIA 2004). Changes to species diversity, numbers and distribution of Arctic-adapted species, vegetation coverage and type, and the physical structure of the landscape itself could result

from changes in climate regimes. Erosion of river banks and beach bluffs, resulting from the thawing of permanently frozen ground, could have severe effects on how subsistence practices are undertaken, as subterranean ice cellars for storing food harvested at remote places for later transportation to the village could collapse and cabins and camps could continue to be washed away. Erosion and climate changes could change water levels in rivers and streams, making transportation by boat and land more difficult, damaging or destroying infrastructure, and reducing water quality (e.g., turbidity, dissolved oxygen) until some waters are no longer are suitable fish habitat. Water flows would increase as glacier fed streams absorbed melting runoff and decline as the glaciers retreated, also changing water quality, fish habitat, and possibly damaging the river valley microhabitats along the north-south oriented rivers of the North Slope. Climate changes could reduce suitable browse for caribou and muskox, possibly shifting their range away from the communities or reducing their numbers. The same habitat changes may favor moose, which Iñupiat hunters perceive as less suitable as subsistence staples because they are solitary, require large ranges per animal, and do not predictably move in large numbers to specific areas, making it more difficult and energy intensive to harvest them. Due to their size, moose also require more effort to butcher, transport, and process than caribou and muskox (ACIA 2004). Climate change could result in a reduction in marine ice and a less safe ice edge, affecting spring marine mammal hunting, including Barrow spring bowhead whale hunting.

Marine currents could be changed by the retreat or disappearance of the ice sheet, shifting some marine mammals much further offshore or to where the habitat is still available, perhaps as far as High Arctic Canada. Migratory waterfowl numbers could decrease, change their migration paths, or go extinct if key habitat was changed. Marine currents could change the distribution and habitats of anadromous and amphidromous fish, which are key subsistence resources for the communities. Warmer temperatures could also reduce habitat for freshwater fish, or change populations to those more suited to warmer waters. Rising sea levels could inundate low-lying coastal lands along the North Slope and change the salinity of surface and ground water, further changing fish and waterfowl habitats and subsistence resource uses. As the landscape becomes less hospitable for human occupation, people could move to new locations on the North Slope, leave the area for either urban Alaska or High Arctic Canada, or adapt to the new conditions with a combination of reduced subsistence resources and increased dependence on outside sources of food and supplies. As a result, community stresses would increase and traditional knowledge of the landscape, environment, and resources would be devalued if conditions changed rapidly. Reduced levels of stratospheric ozone could increase levels of UV exposure to northern peoples, lowering immune system function and increasing the likelihood that residents would suffer increased incidences of skin cancer and cataracts (ACIA 2004).

Effects to subsistence in the foreseeable future are primarily a continuation of effects from the last century. Changes in oil and gas exploration and development technology, as discussed in Section 4.7.4 (Advances in Technology), could mitigate some of the effects observed in the past (e.g., population declines in fish as a result of seismic activity). Increased oil and gas activity and climate changes are likely to continue to affect subsistence activities. For example, additional losses of traditional subsistence harvest areas would occur and traditional subsistence resources may no longer be available for harvest (e.g., some species of migratory birds). Subsistence users would continue to travel farther to harvest resources, but are unlikely to cease subsistence harvests given the strong cultural continuity and value of subsistence activities.

Contribution of Amendment Alternatives to Cumulative Effects

Under the cumulative case, currently planned development in the Planning Area and winter exploration throughout the entire area would continue. Seismic exploration would occur in winter and would include the drilling of exploratory and delineation wells in areas not excluded by buffers. Exploration and development could originate from Inigok, Point Lonely, and the Umiat vicinity, and could encompass important subsistence harvest areas for moose, fish, caribou, and furbearers, affecting subsistence users in Nuiqsut and to a lesser extent Atqasuk, Barrow, and Anaktuvuk Pass. If permanent development is pursued in areas newly opened to exploration and leasing under the action alternatives, Iñupiat users could no longer utilize an area from 5 miles to 25 miles around those facilities for subsistence uses. The areas that would be potentially off-limits due to oil and gas development could represent

a majority of the portion of the subsistence range that is presently undeveloped, and includes areas of great traditional and historic significance and key habitat areas for several crucial subsistence species.

Allowing leasing and development of all or portions of the Teshekpuk Lake Special Area under the action alternatives would dramatically reduce the amount of undisturbed habitat to caribou, waterfowl, fish, and other subsistence species. These effects to subsistence species would be greatest under Alternative C. Effects to subsistence species would be similar under Alternative B and the final Preferred Alternative. Although much of the northeastern portion of the Planning Area would be closed to leasing under Alternative B, the amount of development proposed under this alternative would be about 20 percent greater than for the final Preferred Alternative. Teshekpuk Lake would be deferred from leasing under the final Preferred Alternative, protecting waterfowl and other subsistence species that use the lake. In addition, NSO restrictions on permanent facilities in caribou habitat protection areas and the Goose Molting Area would limit the amount of surface disturbance that could occur north and east of Teshekpuk Lake; these restrictions would reduce the likelihood of cumulative effects to subsistence resources. Under the No Action Alternative, 600,000 acres associated with Teshekpuk Lake Special Area would be closed to leasing.

Avoidance of additional areas as a result of Lease Stipulation D-2, which allows for the development of permanent facilities for exploration (if that is more economical), would impact the subsistence harvest activities of these communities. Building roads into the National Petroleum Reserve – Alaska, with potential public access into Nuiqsut's traditional subsistence range, would have high impacts as residents would be likely to avoid hunting in areas with permanent facilities, and would increase competition for subsistence resources with non-locals.

Conclusion

Exploration and development activities on the North Slope have greatly impacted subsistence activities, as noted during public scoping testimony. In the Planning Area, exploration and development could originate from Inigok, Point Lonely, and the Umiat vicinity, and could encompass important subsistence harvest areas for moose, fish, caribou, and furbearers, affecting subsistence users in Nuiqsut, Atqasuk, Barrow, and Anaktuvuk Pass. Subsistence hunters traveling in nearly every direction from Nuiqsut would have to pass through some kind of development en route to subsistence harvest areas. Iñupiat hunters are reluctant to use firearms near oil production facilities and pipelines, so subsistence users would be unlikely to harvest subsistence resources in these areas. Aircraft have interfered with hunts by scaring game away from hunters, and the increase in air traffic by fixed-wing aircraft and helicopters would make this worse and over a much greater area if development goes forward. This issue has been raised several times by residents of Nuiqsut, who have also noted that oil and gas development is impacting traditional use areas and their ability to pass on knowledge of subsistence resources in these area, and use of these resources, to their children.

Development along the north side of Teshekpuk Lake, outside the area closed to leasing, could deflect or divert caribou hunted in and near the area by Nuiqsut, Barrow, and Atqasuk residents in the summer and winter (SRBA 2003b). Numbers of animals available for harvest could be reduced through the slow destruction of species by habitat loss, predation, climate change, and disease. Diverting animals from their usual and accustomed locations, or building facilities in proximity to those locations, could compel resource harvesters to travel further to avoid development areas. Harvest of subsistence resources in areas further from the communities would require increased effort, risk, and cost on the part of subsistence users. Increasing the areas open for leasing and exploration would lead to development in previously closed areas, leading to concentrating subsistence harvest efforts in the undeveloped areas and increasing the potential for conflict over harvest areas within a community.

Climate change and the associated effects of anticipated warming of the climate regime in the Arctic could significantly affect subsistence harvests and uses if warming trends continues as predicted (NRC 2003, ACIA 2004). Every community in the Arctic is potentially affected by the anticipated climactic shift and there is no plan in place for communities to adapt to or mitigate these potential effects. The reduction, regulation, and/or loss of subsistence resources would have severe effects on the subsistence way of life for residents of Nuiqsut, Atqasuk, Barrow, and Anaktuvuk Pass. If the loss of permafrost, and conditions beneficial to the maintenance of permafrost,

arise as predicted, there could be synergistic cumulative effects on infrastructure, travel, landforms, sea ice, river navigability, habitat, availability of fresh water, and availability of terrestrial mammals, marine mammals, waterfowl and fish, all of which could necessitate relocating communities or their population, shifting the population to places with better subsistence hunting and causing a loss or dispersal of community (NRC 2003, ACIA 2004).

4.7.7.13 Sociocultural Systems

The Iñupiat have developed sociocultural systems, including settlement patterns, kinship, leadership institutions, and cultural values concerning relationships with the land, as tools for successfully adapting to their Arctic environment. The following discussion addresses key events (past, present, and reasonably foreseeable future) and the impacts that these key events have had on sociocultural systems over time. This discussion focuses on sociocultural cumulative effects primarily involving changes in cultural values and social organization.

Past Effects and Their Accumulation

Impacts to the sociocultural systems of the Iñupiat of the North Slope have occurred since the first direct interactions with non-Natives in the first quarter of the 19th century. Since that time, the Iñupiat have adapted to new technologies, new external pressures (e.g., commercial whaling, trapping, reindeer herding, military construction, oil and gas exploration and development), and regulatory actions (e.g., state and federal regulations and International Whaling Commission quotas). (See sections 3.4.2.3 [Traditional Iñupiat Settlement Patterns and Subsistence Use Areas] and Appendix J.5 [Traditional Iñupiat Settelement Patterns and Subsistence Use Areas] for further discussions of these interactions and external pressures.) Adaptations to these external pressures resulted in intensified use of specific resources (e.g., bowhead whales, caribou, and furbearers). Commercial whaling north of the Bering Strait began and ended in approximately 60 years, and introduced a number of impacts to the people and resources of the North Slope such as disease, the introduction of new foodstuffs (e.g., flour, sugar, coffee, and tea), the increased availability of alcohol and tobacco, ongoing efforts at acculturation of the Iñupiat through missions and government schools, and efforts to centralize and make sedentary the highly mobile Iñupiat populations. Over time, the Iñupiat experienced a growing reliance on an external market system to purchase newly introduced technological innovations to support subsistence activities (e.g., firearms, traps, boat motors, snowmachines). Missionaries arrived in the latter quarter of the 19th century to proselytize among the Iñupiat, operate federally-funded schools for the education and indoctrination of Iñupiat youth, provide some level of medical care, administer reindeer herding and other social experiments, and care for orphans whose parents had died in epidemics and accidents. The missionaries considered these efforts as necessary to mitigate the impacts of commercial whaling and prolonged contact with Euroamericans.

Commercial whaling ended by 1910, leaving whale numbers, as well as the Iñupiat population, depleted, and possibly resulted in the decreased availability of other subsistence species (e.g. caribou, moose, seals) and the extirpation of others (e.g. muskox). Fur trading became the main economic pursuit capable of earning the money needed to purchase American goods, such as sugar, tea, tobacco, flour, coffee, and lard, demanded by the Iñupiat. The Iñupiat, whose population was further devastated by the 1918 influenza epidemic, dispersed along the coasts and rivers, pursuing furs and a subsistence way of life until the Great Depression drove fur prices so low that fur trapping was no longer a viable pursuit. Subsistence whaling continued as a practice and as the center of social and political organization on the North Slope, and as the populations of whales and Iñupiat gradually recovered in the 20th century, resettled communities began to field discreet bowhead whale crews (e.g., Nuiqsut and Kaktovik).

With the establishment of the Naval Petroleum Reserve – Alaska in 1923, some initial exploration took place along the North Slope, but oil exploration and development did not commence fully until 1944, when the U.S. Navy and its contractors arrived to intensively explore and drill in the reserve. Following World War II, the U.S. Army constructed DEW-line sites and White Alice Communications System sites on the North Slope, often atop established Iñupiat camps and use areas, and North Slope residents were no longer allowed to hunt at these locations. In the late 1940s, the Bureau of Indian Affairs required families to relocate to population centers (e.g., Barrow, Anaktuvuk Pass) so that children could attend school. In addition, construction of a hospital and churches

at Barrow also encouraged North Slope residents to settle there. Iñupiat harvesters and their families often returned to traditional harvest areas seasonally, and in some cases those without school-aged children never left the traditional areas. In the early 1970s, following the passage of ANCSA, many traditional use areas and former villages were permanently resettled (e.g., Nuiqsut, Atqasuk, Kaktovik, and Point Lay).

By the mid-20th century, Iñupiat settlement patterns had changed significantly. The population became centralized into a few communities, when they previously had been spread in small family-based units across the North Slope sea coast, river banks, and lake shores, and only gathered into centralized locations for temporary, communal hunts (e.g. whales, caribou, molting birds), trading, and festivals. As the market economy and the need for cash for subsistence and survival have expanded, technological means for maintaining connections to the land have moderated the effects of gradually encroaching development along the North Slope. The limits of technology in mitigating the impacts of sedentism and oil development on subsistence activities have been reached. Few areas are out of reach for those with the wherewithal to purchase, maintain, and fuel the high-tech transportation equipment needed to access those areas. However, the expense of subsistence equipment and pursuing subsistence resources, time spent preparing for and on subsistence harvests, and wear and tear on subsistence equipment, restrict the ability of subsistence users to harvest adequate quantities in times of resource scarcity.

The cumulative effects of oil and gas development on sociocultural patterns over the last 50 years are hard to establish with quantitative precision given the lack of baseline data. As stated in Section 4.3.13 (Sociocultural Systems), public testimony indicates that a relationship exists between oil and gas development and social stress or well-being (Ahtuangaruak 1997). However, few data exist to support the correlation between oil and gas development and social stress. One example of a study that is being conducted to explore this relationship is the MMS sponsored study that will analyze NSB residents' observations and perceptions about effects from past, present, and future oil industry activities and other forces of modernity on their lives and subsistence whale hunting activities (EDAW in prep). In addition, the NSB has submitted a grant request to the State of Alaska for a study of the cultural, social, and economic impacts to National Petroleum Reserve – Alaska subsistence communities resulting from current Arctic oil and gas exploration and production. The North Slope Science Initiative, now in the planning stages, could also affect scientific research projects (Argonne National Laboratory 2004). Nonetheless, there is evidence that North Slope sociocultural systems have been subject to ongoing, additive, and synergistic cumulative impacts. Stress on North Slope sociocultural systems, which is generally underreported and inadequately documented, includes residents inability to access traditional use areas, threats to resources/lifeways and to spiritual connection with the land, having to deal with multiple environmental impact assessments and other development processes, and being ignored or discounted by agency representatives. Long-term stresses would result in greater impacts to sociocultural systems. The possibility of a major oil spill, and its effects on bowhead whales and other marine mammals, fish, and wildlife, is of great concern to residents, although no such spill has occurred recently on the North Slope. These stresses accumulate because they interact and are repeated with each new lease sale, EIS, development proposal, and facility expansion (NRC 2003).

Despite effects to sociocultural systems by oil and gas development, what has remained constant over time is the centralization of leadership with whaling captains and their wives, a continued cultural and nutritional dependence on and desire for subsistence foods, a continued reliance on sharing and kinship, a continued connection to family camps and land use areas, and the desire to have control over their communities' present and future. Whaling captains often are in positions of power in city, borough, and other institutions, and the institutions conform to the Iñupiat model of leadership and process. Subsistence foods are important for their nutritional value and their relatively low costs to the community, but most of all for the continued maintenance of the network of human and animal relationships, Iñupiat identity, and the activity of hunting, processing, and sharing as an outlet for individual social stress and a means of reducing community stresses. The desire to have some control over the harvest areas they depend upon, and the stress resulting from development and activities that conflict with their values with no recourse, is a significant stressor to individuals and communities. Some of these conflicts can be mitigated, as in the case of oil and whaler's agreements. Conflicts that are perceived to pit the Iñupiat against agencies and corporations contribute to feelings of futility, powerlessness, and despair, and when coupled with subsistence harvest shortfalls failures, pervasive unemployment, overcrowding, and other issues could result in significant and serious sociocultural consequences (IAI 1990). In the event that whaling quotas were reduced, whales were

deflected offshore to avoid marine and air traffic and noise, or a significant oil spill occurred, whaling could be reduced or stopped, undermining the primary structure of social organization, traditional authority, and political power in the communities. As stated in Section 4.3.13 (Sociocultural Systems), NSB institutions, such as the school district that promotes the teaching of Iñupiat language and culture, the Arctic Eskimo Whaling Commission that negotiates with industry and the IWC to protect Iñupiat subsistence whaling interests, the NSB Department of Wildlife Management, and other regional and village Native corporations and organizations, have been working vigorously and quite successfully at preventing the weakening of traditional Iñupiat cultural institutions and practices. "Oil-Whaler Agreements" have lessened the impact of seismic and other industry operations on subsistence bowhead whale hunting at Cross Island (NRC 2003).

The encroachment of oil production facilities and infrastructure into areas formerly used for subsistence by the Iñupiat increases the difficulties faced by subsistence users in trying to provide culturally valued foods for their extended families. This encroachment includes the permanent oil infrastructure to the east, north, and west of Nuiqsut, as well as the winter exploratory drilling and seismic testing in Inigok and other staging areas. The cycle of oil exploration, development, and production activities, as it is conducted both offshore and onshore, has contributed to harvest shortfalls, a loss of cultural privacy, and challenge to traditional Iñupiat values. Frustration stemming from the inability to provide for the extended family or exercise control over external factors further stresses people who are exposed to these problems. Rosemary Ahtuangaruak, former mayor of Nuiqsut, testified in the 2001 hearings held for the Liberty project, the following:

> One of the biggest issues that affects our community is the loss of control. In addition to the loss of subsistence opportunities, the major severe impacts result from the petroleum development in other areas of the Arctic. It is the lack of control over these events experienced by the village. Nuiqsut residents state they are the last to find out what's happening to them. They are never asked or generally considered about the pattern or course of the industry's development. They are merely informed after major decisions are in place. They would not spend the money making these studies if they were not planning to develop them. So it's a moot issue, after the fact. You're coming for the meeting, but you're already spending the money because you know this project is happening. This perception causes enormous social stress and tension. It is reflected in the increased community social ills, such as the alcoholism, the domestic violence, and the drug abuse. Thus, existing and potential activities further exacerbate and destabilize stress and tension resulting from almost 20 years of petroleum activities in the region. And since development would complete the pattern surrounding our traditional whaling site, it poses the most significant and long-term adverse social and cultural impacts of all the development of the North Slope, the potential for permanent reduction and/or loss of subsistence reserves, and thus, the viability of the Iñupiat way of life.

In response to these types of social disruptions, the NSB, Alaska Eskimo Whaling Commission, regional and tribal governments, and village corporations have instituted efforts to foster and protect Iñupiat traditions. The BLM Subsistence Advisory Panel is tasked with investigating conflicts between subsistence activities and oil and gas development, and making recommendations for the lessee and the BLM for resolution to protect sociocultural values. Health and social services programs have tried to respond to alcohol and drug problems with treatment programs and shelters for abused spouses and families of abused spouses (USDOI BLM 2004c). Effective responses to other health issues, such as asthma, which is attributed to exposure to increased pollution from oil field operations, in addition to a background of cold weather and other injuries and illnesses, suffer from funding shortages. Rosemary Ahtuangaruak testified the following during scoping for the *Alpine Satellite Development Plan EIS* (USDOI BLM 2004c):

> When I started as a health aide in 1985 I had one asthma patient. By the time I went to the University of Washington for my physician assistant certificate in 1989, I had 20 to 25. When I came back in '91, there were 35. When I quit in 2000, there were over 60. The village make-up has not changed; it is still mostly Inupiaq. What was contributing, the most overwhelming issue, was that oil development around the community had increased and gotten closer. The worst nights

> on call were nights with many natural gas flares occurring. We could see it in the flares or in the fields around us. They release particles and they travel to us. The chance of an inversion will affect us. An inversion is a bowl-like air trap with cold air trapped by warm air. Increased concentrations of particulate matter occurs during these episodes.

Summary of Past Effects and Their Accumulation

Impacts to the sociocultural systems of the Iñupiat of the North Slope have occurred since the first direct interactions with non-Natives in the first quarter of the 19th century. Since that time, the Iñupiat have adapted to new technologies, new external pressures, and regulatory actions. By the mid-20th century, Iñupiat settlement patterns had changed significantly. The population became centralized into a few communities, when they previously had been spread in small family-based units across the North Slope. The cumulative effects of oil and gas development on sociocultural patterns over the last 50 years are hard to establish with quantitative precision given the lack of baseline data. Nonetheless, there is evidence that North Slope sociocultural systems have been subject to ongoing, additive, and synergistic cumulative impacts. Stress on North Slope sociocultural systems includes residents inability to access traditional use areas, threats to resources/lifeways and to spiritual connection with the land, having to deal with multiple environmental impact assessments and other development processes, and being ignored or discounted by agency representatives. Long-term stresses would result in greater impacts to sociocultural systems. The possibility of a major oil spill, and its effects on bowhead whales and other marine mammals, fish, and wildlife, is of great concern to residents, although no such spill has occurred recently on the North Slope. These stresses accumulate because they interact and are repeated with each new lease sale, EIS, development proposal, and facility expansion.

Future Effects and Their Accumulation

Continuing oil and gas leasing and development, as well as on-going changes in the Arctic climate, will have impacts on Iñupiat sociocultural systems in the foreseeable future. Development is currently being considered for the northeast corner of the Planning Area (Alpine Satellite Development), and further exploration and delineation activity is ongoing in the leased areas south of Teshekpuk Lake. If oil and gas activities were to continue in areas already leased, Nuiqsut residents would be increasingly isolated from their subsistence resources and would be encircled by development, as stated by noted elder Ruth Nukapigak (1982) and others in the community. Cumulative effects could include changes to social organization, and impacts to cultural values and general community welfare (e.g., health and education). Changes to social organization could potentially occur as a result of changes in population, employment, subsistence harvest patterns, social bonds, and cultural values. In addition, the increase in income in NSB communities could potentially result in an increase in social problems, such as drug and alcohol abuse and violence, as well as increasing conflicts from wealth disparities.

The abandonment of oil fields and the related loss of revenue would no doubt have serious effects on the entire state of Alaska. However, the collapse of commercial enterprise is seen as inevitable and is common over the history of the Iñupiat. Commercial whaling served the same markets as petrochemicals do today, and the Iñupiat survived by returning to the land. Fur trapping collapsed and the Iñupiat people adapted. The Iñupiat are at less risk from the decline of industry than they are in the face of an expanding and unchecked industry. In the event of oil field abandonment, the Iñupiat would likely be employed to assist in the removal and demobilization of the infrastructure and continue with their subsistence pursuits, possibly forming more camps or new communities on the grounds of older communities. Ideally, education would be delivered using home schooling through electronic means, a process currently in its early stages today. Less than 10 percent of Iñupiat history has proceeded in contact with Europeans and Americans, and in those 200 years they have maintained their unique cultural identity as a people throughout the Arctic.

Not all sociocultural changes are negative. Positive impacts come from higher incomes, better health care, improved housing, and improved infrastructure and educational facilities, although these impacts may primarily benefit younger individuals who are generally more accepting of change (NRC 2003). Iñupiat culture as an adaptive mechanism is a powerful means of self-directed social, political, and cultural change capable of sustaining

the Iñupiat through adverse circumstances as it has for centuries guided them through resource shortages, inter- and intra-group social conflicts, and environmental changes.

Global Climate Change

Climate change could cause changes to the environment and habitats of the North Slope that could affect subsistence resources and users, as discussed in Section 4.7.7.12 (Subsistence). Changes in climate regimes could result in changes to species diversity, numbers and distribution of Arctic-adapted species, vegetation coverage and type, and the physical structure of the landscape. If the landscape becomes less hospitable for human occupation, people may move to new locations on the North Slope, leave the area for either urban Alaska or High Arctic Canada, or adapt to the new conditions with a combination of reduced subsistence resources and increased dependence on outside sources of food and supplies. Community stresses could increase as a result, and traditional knowledge of the landscape, environment, and resources would be devalued if conditions change rapidly, reducing the influence of experienced elders in the communities. Reduced levels of stratospheric ozone could continue to allow higher levels of UV exposure to northern peoples, lowering immune system function and increasing the likelihood that residents would suffer increased incidences of skin cancer and cataracts (ACIA 2004).

Contribution of Amendment Alternatives to Cumulative Effects

As noted above, continuing oil and gas leasing and development will have impacts on Iñupiat sociocultural systems in the foreseeable future. If oil and gas activities were to continue in areas already leased, Nuiqsut residents would be increasingly isolated from their subsistence resources and could be encircled by development. Cumulative effects could include changes to social organization, and impacts to cultural values and general community welfare (e.g., health and education). Changes to social organization could potentially occur as a result of changes in population, employment, subsistence harvest patterns, social bonds, and cultural values. In addition, the increase in income in NSB communities could potentially result in an increase in social problems, such as drug and alcohol abuse and violence, as well as increasing conflicts from wealth disparities.

These effects would be greatest under Alternative C, not only because it would result in a greater amount of surface disturbance (as many as 2,000 acres) that the other alternatives (1,570 acres for Alternative B, 1,100 acres for the final Preferred Alternative, and 500 acres for the No Action Alternative), but the entire Planning Area would be available for oil and gas leasing and development. However, the amount of wealth, including income from royalties, taxes, and jobs, generated by oil and gas activity and available to residents of the North Slope would be approximately two- to nine-fold greater under Alternative C than the other alternatives. The effects on wealth and subsistence resources would be least under Alternative A, while the effects on wealth and subsistence resources under Alternative B and the final Preferred Alternative would be between the No Action Alternative and Alternative C.

Conclusion

Both additive and synergistic impacts to sociocultural characteristics of North Slope communities are associated with oil and gas exploration and development on the North Slope. Because of the primary dependence of Anaktuvuk Pass, Atqasuk, Barrow, and Nuiqsut residents on the subsistence caribou harvest from CAH, TLH, and WAH caribou, bowhead whaling offshore, and continued healthy fish, cumulative effects could potentially chronically disrupt sociocultural systems in the community, particularly in the case of bowhead whaling, around which the sociocultural system is based. Caribou hunting provides food and materials that support whaling. Seal hunting provides skins for Barrow's skin boat whaling in the spring and supplies meat for food. Fishing and bird hunting provide meat and fish for whalers as well as for the festivals, *Nalukataq* and *Kivgiq*, associated with whaling. These festivals are important social activities that unify the communities, reunite families, and maintain the continuity of the present with past practice and tradition.

Effects from industrial activities (e.g., noise, light, and chemical pollution), changes in human population and employment, and the accompanying changes in subsistence-harvest patterns, social bonds, and cultural values would be expected to disrupt community activities and traditional practices for harvesting, sharing, and processing

subsistence resources, but they would not be expected to displace sociocultural institutions, social organization, or sociocultural systems. Funding cuts and reduced wage earnings would not likely reduce subsistence uses, but may require changes in seasonal round and longer periods of travel to get to subsistence harvest areas; however, these would more than likely resemble the pre-1950 pattern of residence and travel, and technology is available that could facilitate education services delivery via electronic means.

Health issues caused by persistent and short-term pollution could shorten life spans of elders, who are the key repositories of traditional and cultural knowledge in the communities. Health issues from increased injuries as a result of the need to travel further over rough terrain to support families with subsistence foods could reduce community involvement with employment, tax the community health infrastructure, encourage outmigration, and lead to increases in substance abuse and depression in those no longer able to participate in subsistence activities. Cuts in funding for services would increase the severity of the problem of delivery of health services as well as maintaining health and hygiene infrastructure (e.g. fresh water, sewers, and washeteria).

Because of impacts from climate change on long-standing traditional hunting and gathering practices that promote health and cultural identity, and considering the limited capacities and choices for adaptation and the ongoing cultural challenges of globalization to indigenous communities, North Slope peoples would experience cultural stresses as well as impacts to population, employment, and local infrastructure. The termination of oil activity could result in the outmigration of non-Iñupiat people from the North Slope, along with some Iñupiat who may depend on higher levels of medical support or other infrastructure and services than may be available in a fiscally-constrained, post-oil production circumstance. If subsistence livelihoods are disrupted, Iñupiat communities could face increased poverty, drug and alcohol abuse, and other social problems resulting from a loss of relationship to subsistence resources, the inability to support a productive family unit, and a dependence on non-subsistence foods (Langdon 1995, Peterson and Johnson 1995, USGCRP 2000, IPCC 2001). As stated by Parson et al. (2001), "It is possible that projected climate change will overwhelm the available responses." It is also realistic to expect that some general assistance could be found to mitigate the losses of nutrition, health, and income from diminished subsistence resources, but such assistance would likely have little effect in mitigating the associated social and cultural impacts.

4.7.7.14 Environmental Justice

Activities that impact subsistence resources and access to those resources could have a disproportionately high impact on minority and low-income communities. Alaska Iñupiat Natives, a recognized minority, are the predominant residents of the NSB, the area that would likely be most affected by activities in the Planning Area under the four alternatives, and activities associated with other projects on the North Slope. Environmental justice effects on Iñupiat Natives have occurred in the past from non-oil and gas, and from oil and gas impacts on their subsistence resources and harvest practices. Causes of cumulative effects would include commercial harvest of fish, oil spills, noise and traffic disturbance, and disturbance from construction activities associated with exploration and development on the North Slope. In addition, habitat reduction and increased local population pressure continue to challenge the survival of many traditional subsistence practices. It is expected that cumulative effects to subsistence resources, harvest practices, and sociocultural patterns from noise, disturbance, and oil spills would primarily impact the Iñupiat communities of Anaktuvuk Pass, Atqasuk, Barrow, and Nuiqsut within the NSB. The following sections discuss some of these impacts to Iñupiat Natives that have occurred in the past and could occur in the future. Since cumulative effects to subsistence resources have been discussed in much detail in earlier sections, the reader is encouraged to read earlier cumulative effects sections on vegetation, fish, birds, mammals, endangered and threatened species, and subsistence (sections 4.7.7.5, 4.7.7.7, 4.7.7.8, 4.7.7.9, 4.7.7.10, and 4.7.7.12).

Past Effects and Their Accumulation

Prior to sustained contact between the Iñupiat of the North Slope and Euroamericans, effects to the sociocultural and subsistence activities of Native communities were primarily the result of natural factors, including weather and natural population cycles of subsistence animals. As discussed in Section 4.7.7.12 (Subsistence), the advent of

commercial whaling in the Pacific Ocean and subsequent Euroamerican influence had a profound affect on the people and resources of the North Slope. Effects on the Iñupiat of the North Slope included disease; introduction of new foodstuffs, including flour, sugar, coffee, and tea; the increased availability of alcohol and tobacco; ongoing efforts at acculturation of the Iñupiat through missions and government schools; and efforts to centralize and make sedentary the highly mobile populations of Iñupiat. The failure of commercial whaling by 1910 coincided with a depletion in the number of whales available for harvest, making the ongoing subsistence harvest difficult for the Iñupiat remaining along the Arctic coast. Further complicating subsistence whale harvest was a decrease in the Iñupiat population due to disease, accidents, and poor health care. Iñupiat and whale populations gradually recovered during the 20th century. Some whale populations, however, including bowhead whales, are still depressed from historic levels. Following a reduced presence of Euroamericans in the beginning of the 20th century, due to the collapse of commercial whaling, the Iñupiat returned to their highly dispersed way of life, with additional emphasis on fur trapping and reindeer herding as a source of money to buy those Euroamerican goods they desired.

Oil and gas exploration from 1920 to 1968 brought changes to the Iñupiat people. By 1950, the Bureau of Indian Affairs was requiring families with school age children to relocate to population centers (e.g., Barrow) so that the children could attend school. Construction of a hospital and churches at Barrow also encouraged North Slope residents to settle there. Children were sent outside to boarding schools, including Chemawa in Oregon and Mt. Edgecumbe in Sitka. The children that returned from these boarding schools often became spokespeople for the community and interposed themselves between the forces of development and the conservation of traditional ways of life.

During the mid-20th century, the Department of Defense contracted for the construction of DEW-line and WACS sites on the North Slope. North Slope residents were no longer allowed to hunt near these locations, all of which were situated at or near important subsistence or residence sites. Operation of these sites by the military, and later by contractors, resulted in contamination of the surrounding area with fuel, oil, antifreeze, and other chemicals, which led to avoidance of these areas by subsistence harvesters concerned about chemical contamination. Postwar oil exploration and the sustained contact with Euroamericans, brought by activities associated with oil and the Cold War, resulted in additive impacts on subsistence resources, harvest patterns, and users. In addition, development associated with villages on the North Slope impacted subsistence resources. These activities cumulatively resulted in the loss of approximately 2,500 acres of habitat for subsistence species.

The most intense oil and gas development activity, and increased impacts to subsistence activities, occurred during the 1970s and early 1980s (e.g., development of the Prudhoe Bay and Kuparuk oil fields, construction of TAPS and the haul road, and construction of a large portion of the roads, drilling pads, gravel sources, collector pipelines, and production facilities). This activity has resulted in the cumulative direct loss and indirect loss of approximately 13,000 acres and 21,000 acres of habitat, respectively, for subsistence species, and higher levels of disturbance that can impact species health, reproduction, and survivorship.

As discussed in Section 4.7.7.12 (Subsistence), North Slope residents have noted the decline of fish populations caused by seismic activities, the diversion of caribou from traditional migration routes and calving areas caused by an increased number of low flying aircraft, the disruption of caribou movements by low pipelines, and the ending of use of traditional harvest areas due to the avoidance of industrial areas by hunters. Oil and gas development in the Prudhoe Bay and Kuparuk areas discouraged Nuiqsut residents from using the eastern portions of their traditional harvest areas (see Appendix J; Section J.10.4 and maps J-7 through J-13). Additionally, bowhead whaling quotas instituted by the International Whaling Commission resulted in the establishment of the Alaska Eskimo Whaling Commission. Some residents were profoundly concerned about impacts to marine resources, and so opposed any oil development in the marine environment.

Impacts to subsistence cased by the seismic exploration programs on the North Slope have also been observed for many years. Although seismic testing no longer uses dynamite on fish bearing lakes, Iñupiat blamed this activity for declines in fish numbers in the vast number of interconnected lakes and streams used by subsistence fishermen. Arnold Brower, Jr. stated in scoping testimony for the 1998 Northeast National Petroleum Reserve – Alaska

meetings a consensus opinion among Iñupiat subsistence hunters that seismic testing, even in its current refined form, deflects subsistence animals from the areas it operates in.

In the past, oil and gas activities have deterred subsistence users from using their traditional subsistence use areas. The continued expansion of this activity across the ACP from Prudhoe Bay westward could increase the area considered off-limits by resource users, deflect or divert important subsistence resources from their normal routes, and require users to travel farther to harvest subsistence foods (IAI 1990a). The continued increase in developed area would reduce the amount of suitable lands available for Nuiqsut residents to harvest necessary subsistence resources away from oil and gas facilities.

Summary of Past Effects and Their Accumulation

Euroamerican presence, commercial whaling, and non-oil and gas development and oil and gas exploration and development have had cumulative impacts to Iñupiat culture and to fish and wildlife used for subsistence. Euroamerican presence has impacted the Iñupiat through disease and other ills. Commercial whaling nearly decimated whale stocks in the Chukchi and Beaufort seas; bowhead whale populations, though recovering, remain nearly 80 percent below levels in the 1800s. Non-oil and gas development associated with military, residential, and commercial development have directly impacted several thousand acres of fish and wildlife habitat and have also indirectly affected habitat and animal behavior effects that have accumulated and persist today. Oil and gas exploration and development conducted by the federal government and industry have directly impacted the habitat use and behavior of subsistence species that also persists today. These effects have disrupted subsistence livelihoods, and may, in part, account for some of the social problems seen in the villages today.

Future Effects and Their Accumulation

The Iñupiat people will be affected by future disturbances to key subsistence species that leads to disruption, displacement, or long-term changes in species' populations. Expanded oil and gas development on the North Slope, on both federal and state leases, would increase disturbance effects to subsistence species and harvest patterns. While each individual project would likely be a small incremental increase, the cumulative effect would eventually become more and more repressive to the subsistence lifestyle. As discussed for other resource areas, 5,000 or more acres could be directly impacted from oil and gas development associated with activities in the National Petroleum Reserve – Alaska and elsewhere on the North Slope in the future. Indirect impacts to soil, water, and vegetation could be three to four times the amount of direct disturbance.

In addition to direct and indirect loss of habitat that can affect subsistence species, noise and other disturbance associated with oil and gas development would divert, deflect, and disturb subsistence species, potentially having population-level effects that would accumulate. Oil and gas development could also affect subsistence harvest by causing subsistence hunters to avoid certain areas because of concerns about firearm safety, and perhaps for aesthetic reasons. Although the North Slope still has huge amount of area that is relatively undisturbed, the general subsistence-hunting environment continues to change in response to increased development. During the past several decades, populations of caribou, bowhead whales, and other wildlife and fish have generally increased, to the benefit of subsistence hunters, despite habitat, disturbance, and other effects that have accumulated. However, there is no certainty that these trends would continue into the future, especially as the effects of global climate change on the Arctic environment become more pronounced.

Oil-spill contamination of subsistence foods is another important concern regarding potential effects on Native health. Although some contamination remains on the North Slope from past military and government activities, and from the early days of oil and gas development, the effects on subsistence species and users are minor. Efforts to clean up old disposal sites in the past have helped to reduce the effects that would accumulate with spill effects in the future. Human health could be threatened in areas affected by oil spills, but these risks can be reduced through timely warnings about spills, forecasts about which areas may be affected, and even evacuation of people and avoidance of marine and terrestrial foods that might be affected. In the unlikely event that a large spill were to occur and contaminate essential whaling areas, major effects to subsistence resources could result from the combined factors of shoreline contamination, tainting concerns, clean-up disturbance, and disruption of subsistence

practices. Such impacts would have a disproportionately high affect on Alaska Natives. Contamination of subsistence foods by oil spills would potentially affect Native health and health and survivorship of subsistence species.

Transportation facilities and activities would also contribute to cumulative effects to subsistence resources and, consequently, to the Native population. A new permanent road connection from TAPS to Nuiqsut and the National Petroleum Reserve – Alaska would also facilitate petroleum development, and could provide an additional travel route for the public to the North Slope. This could encourage more hunters and other visitors to travel to the Planning Area, increasing the potential for conflicts between subsistence users and other users of fish and wildlife resources.

It is acknowledged that cumulative sociocultural impacts have occurred on the North Slope and that Iñupiat culture has undergone a noticeable change. The influx of money from wage employment has added many benefits and raised the standard of living, but has also given rise to an array of social pathologies, including increased alcoholism, as discussed in Section 4.7.7.13, Sociocultural Systems.

Global Climate Change

It is difficult to determine exactly how global climate change figures into the cumulative mix. It is expected that global climate change affects animal populations, but the type, location, and magnitude of effects appears to be the subject of some disagreement. Regardless of exactly what those effects would be, changes to the numbers of animals or patterns of animal behavior would affect subsistence harvests, and the effects would thus be interactive with those of other North Slope activities. Whether global climate change would exacerbate effects on subsistence species or ameliorate them remains a subject for speculation.

Contribution of Amendment Alternatives to Cumulative Effects

Under the cumulative case, currently planned development in the Planning Area and winter exploration throughout the entire area would continue. Seismic exploration would occur in winter and would include the drilling of exploratory and delineation wells in areas not excluded by buffers. Exploration and development could originate from Inigok, Point Lonely, and the Umiat vicinity, and could encompass important subsistence harvest areas for moose, fish, caribou, and furbearers, affecting subsistence users in Nuiqsut and to a lesser extent in Atqasuk, Barrow, and Anaktuvuk Pass. If permanent development is pursued in areas newly opened to exploration and leasing under alternatives B, C, and the final Preferred Alternative, Iñupiat users could no longer utilize an area from 5 miles to 25 miles around those facilities for subsistence uses. The areas that would be potentially off-limits could represent a majority of the portion of the subsistence range that is presently undeveloped, and includes areas of great traditional and historic significance and key habitat areas for several crucial subsistence species.

Allowing leasing and development of all or portions of the Teshekpuk Lake Special Area under the action alternatives would dramatically reduce the amount of undisturbed habitat to caribou, waterfowl, fish, and other subsistence species. These effects to subsistence species would be greatest under Alternative C. Effects to subsistence species would be similar under Alternative B and the final Preferred Alternative. Although much of the northeastern portion of the Planning Area would be closed to leasing under Alternative B, the amount of development proposed under this alternative would be about 20 percent greater than for the final Preferred Alternative. Teshekpuk Lake would be deferred from leasing under the final Preferred Alternative, protecting waterfowl and other subsistence species that use the lake. In addition, NSO restrictions on permanent facilities in caribou habitat protection areas and the Goose Molting Area would limit the amount of surface disturbance that could occur north and east of Teshekpuk Lake; these restrictions would reduce the likelihood of cumulative effects to cultural resources. Under the No Action Alternative, 600,000 acres associated with Teshekpuk Lake Special Area would be closed to leasing.

Conclusion

Alaska Iñupiat Natives, a recognized minority, are the predominant residents of the NSB, the area that would likely be affected by exploration and development in the Planning Area and other past, present, and reasonably foreseeable projects on the North Slope. Environmental justice effects on Iñupiat Natives could occur because of their reliance on subsistence foods, and cumulative effects would increase the effects on subsistence resources and harvest practices.

Potential effects would focus on the Iñupiat communities of Point Lay, Wainwright, Barrow, Atqasuk, and Nuiqsut within the NSB. Based on potential cumulative, long-term displacement and/or functional loss of CAH, TLH, and WAH caribou habitat over the life of the Northeast National Petroleum Reserve – Alaska oil and gas lease sales, and from other oil and gas developments on the North Slope, this important subsistence resource could become less readily available or undesirable for use, or experience long-term population and productivity effects. Such impacts would disproportionately affect Alaska Natives. Access to subsistence-hunting areas and subsistence resources, and the use of subsistence resources, could change if oil development were to reduce the availability of resources or alter their distribution patterns.

Because the potential impacts of climate change on marine and terrestrial ecosystems in the Arctic would cause impacts on subsistence resources, traditional culture, and community infrastructure, subsistence-based indigenous communities in the Arctic would be expected to experience disproportionate, environmental and health effects.

In the unlikely event that a large spill were to occur and contaminate essential whaling areas, major effects to subsistence resources could result from the combined factors of shoreline contamination, tainting concerns, clean-up disturbance, and disruption of subsistence practices. Such impacts would have a disproportionately high affect on Alaska Natives. Contamination of subsistence foods by oil spills would potentially affect Native health.

It is expected that the cumulative effects on subsistence resources and subsistence harvests in the Planning Area would be expected to be mitigated substantially, though not eliminated, by proposed ROPs and lease stipulations.

4.7.7.15 Coastal Zone Management

Activities associated with cumulative effects on the North Slope include those occurring under the amendment alternatives, oil and gas development in the Northwest National Petroleum Reserve – Alaska, federal and state offshore oil development, state onshore oil development, and oil and gas transportation. The activities associated with exploration, facility construction, operation and maintenance, and oil spills are the most important elements for the cumulative analysis because of their potential disturbance and habitat impacts.

While the Planning Area is technically outside the coastal zone, it is within the NSB. The NSB applies its Comprehensive Plan policies and CMP policies to all developments occurring on private, federal, and state lands; however, the NSB's jurisdiction is the subject of litigation. Oil and gas development activities could include portions of road/pipeline corridors, including the offshore portions (such as inlets and bays) within the NSB boundary. Development activities occurring adjacent to the Colville and Ikpikpuk rivers that could affect coastal resources or uses, including activities described in exploration plans and development and production plans, could be subject to the statewide standards and NSB district policies of the ACMP. Policies of the ACMP are examined herein for potential conflicts with effects from oil and gas exploration or development activities. Potential effects are summarized as succinctly as possible. Additional information is contained in the Coastal Zone Management section of the 1998 Northeast IAP/EIS (USDOI BLM and MMS 1998).

Although all federal lands, including those within the Planning Area, are categorically defined as being outside of the coastal zone, all federal activities and federally-permitted activities must be reviewed for consistency with coastal management programs. Therefore, onshore activities within the Planning Area and some offshore activities identified under the alternatives should be assessed against the Alaska CMP, including the NSB CMP.

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Non-oil and gas activities on the North Slope are subject to all applicable lease stipulations listed in the 1998 Northeast IAP/EIS ROD (for Planning Area), as well as any other federal, state, or NSB regulations that pertain to the activities in question (for Planning Area and remainder of North Slope). These activities include aircraft use for point-to-point transport, and wildlife and other aerial surveys; ground activities such as seismic surveys, resource inventories for paleontological and cultural excavations, research and recreational camps, and overland moves; and guided hunting and river float parties on the Colville River from the headwaters to below Umiat. Hazardous and solid waste spills, and removal and remediation have occurred at abandoned drill sites. Oil spills have occurred at fuel storage sites and camps, but the size of these spills have been small. Clean-up activities have not greatly disturbed subsistence harvest activities or the surrounding environment. Development associated with past military and other government activities, and from growth of villages, has had effects on subsistence species and subsistence users that were minor, but still persist today.

Oil and Gas Exploration and Development Activities

Coastal Development and Access (11 AAC 112.200 and 11 AAC 112.220). Water dependency is a prime criterion for development along the shoreline. The intent of this policy is to ensure that onshore developments and activities that could be placed inland would not displace activities that depend on shoreline locations, which include marine, lakeshore, and river waterfronts. Access to coastal areas by Iñupiat Natives has been restricted at Prudhoe Bay and other coastal facilities for the safety of the Natives and for protection of oil field infrastructure. A concern brought up during scoping for this amendment was the inability of some Natives to visit historic cabins and campsites used by ancestors at Prudhoe Bay. The loss of access to some coastal areas on the North Slope is an effect that persists today.

Energy Facilities (11 AAC 112.230). The ACMP requires that decisions on the siting and approval of energy-related facilities be based, to the extent practicable, on 16 criteria within the energy facilities standard. Other criteria within this standard require that facilities be consolidated and sited in areas of least biological productivity, diversity, and vulnerability and where effluents and spills can be controlled or contained (11 AAC 112.230 (a) [3] and [14]). The NSB CMP also requires that transportation facilities and utilities must be consolidated to the maximum extent possible (NSB CMP 2.4.5.2[t] and NSBMC 19.70.050.K.6).

In the past, facilities have generally been sited where oil resources were most easily accessed. As a result, areas with high biological productivity, especially coastal wetlands, have been impacted by oil and gas development. The loss of this productivity persists today. Recent technology that reduces the size of the gravel footprint needed for development and production, and encourages directional drilling, have allowed oil and gas developers to site facilities in areas with lower biological productivity.

Utility Routes and Facilities (11 AAC 112.240) and Transportation Routes and Facilities (11 AAC 112.280). These statewide standards require that routes for transportation and utilities be compatible with district programs and sited inland from shorelines and beaches. Utility routes and facilities along the coast must avoid, minimize, or mitigate alterations in drainage patterns, disruption in wildlife transit, and blockage of existing or traditional access.

As discussed for bird and mammal resources, roads and pipelines have altered drainage patterns, disrupted wildlife movements, habitat use, and reproductive success, especially for caribou, and have restricted traditional access into important subsistence areas (NRC 2003). Over 9,000 acres have been directly impacted by gravel roads and pads, and alteration in drainage patterns has occurred on nearly twice that many acres. Caribou avoid, or are hesitant to cross roads, during migrations to foraging and insect-relief habitats (see Section 4.7.7.9; Mammals). In the past, pipelines were often placed low to the ground, and even now, pipeline height does not have to exceed 5 feet within the Planning Area. Pipelines that are close to the ground have acted as a physical barrier to caribou movement, and to subsistence hunters on snowmachines or other vehicles.

Sand and Gravel Extraction (11 AAC 112.260). Extraction of sand and gravel is a major concern on the North Slope. Gravel resources are needed for construction of pads, roadbeds, berms, causeways, and docks to protect the tundra. The ACMP statewide standards indicate sand and gravel may be extracted from coastal waters, intertidal areas, barrier islands, and spits if no practicable noncoastal alternative is available to meet the public need.

Through 2001, over 6,300 acres had been impacted for gravel mines on the North Slope; prior to 1968, only 24 acres had been impacted (NRC 2003). Eighty percent of these mines were located in rivers, the remainder in tundra. As discussed in Section 4.7.7.7 (Fish Resources), only about 1,800 acres of mine disturbance persists today, evenly divided between tundra and river sites. Many of the river sites were filled in when the river channel shifted, while others have been reclaimed to provide deepwater habitat, which is important to wintering fish. Thus, most of the effects associated with past gravel mines have been compensated for through development of new fish habitat.

Subsistence (11 AAC 112.270). The statewide standard for subsistence indicates a project within a designated subsistence use area must avoid or minimize impacts to subsistence uses of coastal resources. Subsistence uses of coastal resources and maintenance of the subsistence way of life are primary concerns of the residents of the NSB. However, access to subsistence resources, and subsistence hunting and resource use have been affected by oil and gas development, as discussed in section 4.7.7.12 (Subsistence). Subsistence resource availability has been effected by direct and indirect loss of habitat and from disturbance to animals from pipelines, structures, support-bases, pump stations, and roads.

Policy 2.4.3(d) (NSBMC 19.70.050.D) requires that development not preclude reasonable access to a subsistence resource. Onshore pipelines and construction activities could cause disruptions to subsistence caribou harvests from access and movement conflicts. Iñupiat Natives tend to avoid hunting and fishing near oil facilities, and as discussed in Appendix J, they travel further to reach subsistence resources than occurred in the past. These effects persist today.

Habitats (11 AAC 112.300). The ACMP statewide standard for habitats in the coastal zone requires that habitats be managed to avoid, minimize, or mitigate significant adverse impacts to habitat resources. This policy is supported by an NSB CMP policy requiring that development be located, designed, and maintained in a manner that prevents substantial impacts on fish and wildlife and their habitats, including water circulation and drainage patterns and coastal processes (NSB CMP 2.4.5.2[b] and NSBMC 19.70.050.K.2).

Past activities in the Planning Area and on the North Slope have degraded habitat, as discussed under related plant and animal resource areas. In the context of the North Slope and ACP, the amount of habitat directly or indirectly harmed from oil and gas activities has been less than 1 percent, and most populations of fish and wildlife appear healthy and are stable or increasing. Caribou and bowhead whale, important subsistence species, have shown steady population gains during the past several decades (NRC 2003). Populations of brant and several species of shorebirds, however, are declining, although it is not known if the causes of the decline are related to activities on the North Slope, or from activities occurring on the migration or wintering grounds, or both. Some effects of oil and gas development have countervailing effects. For example, vegetation and soil are lost from gravel mines, but mines also provide important wintering habitat for fish and loafing habitat for birds.

Air, Land, and Water Quality (11 AAC 112.310). The air, land, and water quality standard of the ACMP incorporates, by reference, all the statutes pertaining to, and regulations and procedures of, the ADEC. The NSB reiterates this standard in its district policies and emphasizes the need to comply with specific water and air quality regulations in several additional policies. Water quality can be affected by oil spills, deliberate discharges and emissions, and gravel operations.

As discussed in Section 4.7.7.1 (Air Quality), air quality on the North Slope meets NAAQS and air quality is relatively pristine. Arctic haze has occurred in the past, but the source of this haze appears to be pollutants from Europe and Asia. There have been minor effects to vegetation from air pollutants, but these effects are not likely to occur and persist at a level that would harm subsistence species.

Based on the history of military activities and oil and gas exploration and development on the North Slope, as discussed in Section 3.2.10 (Hazardous Materials), large amounts of hazardous material and waste have been dumped on the tundra, often onto the ground or into unlined storage facilities, and these materials have impacted local surface and groundwater sources. Much of this material was removed in the 1970s and early 1980s, and some cleanup continues today, although some effects from these actions likely persist today.

Historic, Prehistoric, and Archeological Resources (11 AAC 112.320). The ACMP statewide standard requires that coastal districts and appropriate state agencies identify areas of the coast that are important to the study, understanding, or illustration of national, state, or local history or prehistory, including natural processes. The NSB developed additional policies to ensure protection of its heritage. Traditional activities at cultural or historic sites also are protected under the NSB CMP 2.4.3(f) (NSBMC 19.70.050.F) and 2.4.5.2(h) (NSBMC 19.70.050.K.8).

As discussed in Section 4.7.7.11 (Cultural Resources), interest in the geology and archaeology of the North Slope began in earnest at the beginning of the 20th century, but access was generally limited to coastal or easily accessible areas (see Section 3.4.1.8; European/Euro-American Expansion, Exploration, and Ethnographic Research). Effects to cultural resources in the National Petroleum Reserve - Alaska have been occurring since 1923, when oil and gas exploration and mapping began with USGS surveys of the Reserve, assisted by Native guides. With the onset of the Cold War, military activity on the North Slope also affected cultural resources. During the 1950s, ground-disturbing activities associated with the rapid construction of the DEW-Line and WACS sites affected cultural resources. Continued and increasing amounts of oil and gas exploration and drilling across the North Slope further affected cultural resources and Native peoples' relationships with their ancestral homelands.

Following Alaska statehood in 1959, land selections were made by the state and federal governments, which did not include Native land ownership except as provided for under the Indian Allotment Act of 1906. No effort was made at that time to inventory, identify, record, or document Native land use or historic and archaeological sites as a result of these land selections. As a result of this lack of strong legal protection, oil development and production during this initial period severely impacted cultural resources and diminished some peoples' relationships with their individual and collective history.

The most intense oil and gas development activity occurred during the 1970s and early 1980s (e.g., development of the Prudhoe Bay and Kuparuk oil fields, construction of TAPS and the haul road, and construction of a large portion of the roads, drilling pads, gravel sources, collector pipelines, and production facilities). These developments occurred following the passage of the NHPA (1966) and NEPA (1969) that mandated the identification of cultural resources potentially affected by these developments and mitigation of the impacts. In addition, these developments resulted in the discovery of many previously undocumented cultural resources. In part, increased oil and gas exploration and development activity prompted the NSB to initiate the Traditional Land Use Inventory. In 1977 and 1978, an archaeological survey was conducted in select areas of the National Petroleum Reserve - Alaska. This survey resulted in the identification of 728 cultural resource sites in the Planning Area.

Summary of Past Effects and Their Accumulation

As most non-oil and gas development, and oil and gas development on the North Slope has occurred near the coastline, conflicts with the NSB and State of Alaska coastal zone management policies have occurred in the past. Specific issues include limits on access to coastal areas by Alaska Natives, disturbance to and deflection of caribou moving to insect-relief areas along the coast, loss of habitat, and loss of historical, cultural, and archaeological resources resulting from exploration and development along the coastline. Through consultation, conflicts between coastal zone management policies and proposed development that could occur in coastal areas have been reduced since implementation of coastal management policies.

Future Effects and Their Accumulation

The ACMP statewide standards and NSB enforceable policies that are relevant to the analysis of the alternatives for this amendment remain relevant for the cumulative case. Although the level of effects could increase for the cumulative case, the scenarios assumed for the analyses in this amendment would not be expected to conflict with the statewide standards or the district policies. Activities that would occur outside the boundaries of the National Petroleum Reserve - Alaska, but within the NSB (including the coastal zone), would require permitting and approval from the NSB before proceeding. Those activities would not be approved by the NSB if they conflicted with the coastal management program enforceable policies. In addition, the BLM would consult with the State of Alaska DNR regarding coastal zone consistency determination when a lease sale is proposed to ensure that the BLM is in compliance with the CZMA. Thus, effects would accumulate under coastal zone management in the future, but would not conflict with policies of the State of Alaska and Borough coastal zone management programs.

Coastal Development and Access (11 AAC 112.200 and 11 AAC 112.220)

The potential for Alaska Natives to be denied access to coastal areas would increase as more development occurs near the coast. However, the BLM proposes to implement Lease Stipulation K-6 (Coastal Areas) to prohibit or minimize development within ¾ of a mile of the coastline. This lease stipulation should ensure that the coastline remains relatively unspoiled and allows for Alaska Native access to coastal areas adjacent to the National Petroleum Reserve – Alaska.

Energy Facilities (11 AAC 112.230), Utility Routes and Facilities (11 AAC 112.240), Transportation Routes and Facilities (11 AAC 112.280)

The NSB CMP contains several additional policies related to transportation and utilities that may be relevant to this analysis. All but one of the policies are best-effort policies and subject to some flexibility if: 1) there is a substantial public need for the proposed use and activity; 2) all feasible and prudent alternatives have been rigorously explored and objectively evaluated; and 3) all feasible and prudent steps have been taken to avoid the effects the policy was intended to prevent. Transportation development, including pipelines, which obstructs wildlife migration is subject to the three conditions listed above (NSB CMP 2.4.5.1 [g] and NSBMC 19. 70.050.J. 7). The oil and gas industry, in consultation with federal, state, and local agencies, has implemented policies and management procedures to minimize impacts to caribou and other wildlife from pipelines and other linear facilities that would benefit wildlife in the future. These include the requirement that pipelines be a minimum of 5 feet above the ground, and that roads, pipelines, and other utility lines use a common corridor.

Sand and Gravel Extraction (11 AAC 112.260)

The ACMP statewide standards indicate sand and gravel may be extracted from coastal waters, intertidal areas, barrier islands, and spits if no practicable noncoastal alternative is available to meet the public need.

Approximately 6,300 acres have been impacted by gravel mines on the North Slope (NRC 2003). Much of the gravel was obtained from gravel deposits within floodplains. But concerns arising from this practice prompted the USFWS to study the effects of floodplain gravel mining on the floodplains physical and biotic processes (Woodward-Clyde Consultants 1980). The study identified numerous examples of habitat modification, including increased channel braiding, loss of wintering areas, spreading of flow, and restriction of fish movements, such as fish mortality caused by stranding. The study also set forth guidelines for gravel mining to minimize floodplain damage (Joyce et al. 1980). In response to agency concerns, and the results of the USFWS study, new gravel mines have primarily been sited in upland sites since the 1980s. Few good sources of gravel have been identified in the Planning Area, although limited effort has been spent on identifying potential gravel sources within the Reserve. Future gravel sites would be sited in upland areas, and away from the coast, where feasible.

Subsistence (11 AAC 112.270)

Access to subsistence-hunting areas and subsistence resources, and the use of subsistence resources, could change if development were to reduce the availability of these resources or alter their distribution patterns. Activities that could affect subsistence resources and access include noise and traffic disturbance, disturbance from construction activities associated with ice roads, production facilities, pipelines, gravel mining, supply efforts, and the unlikely event of a large oil spill and associated clean-up efforts. Of these, the unlikely event of a large spill is the only occurrence that could substantially interfere with access to subsistence resources. If a large spill were to occur and essential harvesting areas were contaminated, effects could result from the combined factors of shoreline contamination, tainting concerns, clean-up disturbance, and disruption of subsistence practices.

The other impacting factors either would not be expected to have more than local, short-term impacts, or could be effectively addressed through the proposed suite of lease stipulations and ROPs. The proposed lease stipulations and ROPs, existing regulations and management practices, and future conditions placed on permits for future projects would serve to assure that the timing and monitoring of potential sources of disturbance would minimize conflicts with subsistence activities. Activities addressed for cumulative effects would not be likely to result in conflict with this statewide standard or with the district enforceable policies.

Habitats (11 AAC 112.300)

The effects of pipelines, roads, and facilities installation and construction are magnified in the cumulative case. However, the analyses indicate that the potential additive effects would not substantially alter or interfere with the habitats, species, and activities that these standards address. Cumulative effects are not anticipated to increase the potential for conflict with these statewide standards. Siting of energy facilities, transportation, and utilities outside the boundaries of the National Petroleum Reserve – Alaska (but within the boundaries of the NSB and the coastal zone) would require NSB permitting and approval. The NSB policies would be addressed through this approval process, and permitting would be dependent upon adherence to these policies.

Air, Land, and Water Quality (11 AAC 112.310)

As discussed in Section 4.7.7.1 (Air Quality), air quality on the North Slope meets NAAQS and air quality is relatively pristine. Arctic haze has occurred in the past, but the source of this haze appears to be pollutants from Europe and Asia. As oil production declines on the North Slope, and new air pollutant control technologies are implemented, the amount of air pollutants would continue to decrease from historic levels on the North Slope.

Historic, Prehistoric, and Archeological Resources (11 AAC 112.320)

Historic, prehistoric, and archaeological resources are nonrenewable, and displacement or contamination of these resources could affect the cultural and scientific values of the resource. The cumulative effects of oil and gas exploration and development within the Planning Area and across the North Slope are difficult to estimate given the scattered nature of historic, prehistoric, and archaeological resource deposits, their surface or near-surface contexts, and difficulty in predicting their location. As long as surveys and inventories were completed prior to exploration and development, the effects on these resources would be minimized. The accidental discovery or damage to sites, presently known or unknown, would to some extent damage those sites, but would also require measures to recover or record the remaining material, adding that information to the archaeological record of the North Slope.

The NHPA requires agencies, or their permittees, to complete a cultural resources survey before any undertaking occurs (i.e., a ground-disturbing activity, such as well drilling, construction of infrastructure or the construction of buried pipelines) on federal lands. The BLM's guidelines and policies require that all effects to any cultural resources identified during surveys must be mitigated to the satisfaction of the land manager and the SHPO. Lease stipulations and ROPs developed for the action alternatives would minimize or prohibit exploration and development activities near major rivers, reducing the likelihood of impacts to historic, prehistoric, and archaeological resources.

Global Climate Change

Rising temperatures are altering the Arctic coastline and changes are projected to continue during this century as a result of reduced sea ice, thawing permafrost, and sea-level rise (ACIA 2004). Thinner, less extensive sea ice creates more open water, allowing stronger wave generation by winds and increasing wave-induced erosion along Arctic shores.

Rising sea level is very likely to inundate marshes and coastal plains, accelerate beach erosion, and force salt water into bays, rivers, and groundwater. Coastal regions with underlying permafrost are especially vulnerable to erosion as ice beneath the seabed and shoreline thaws from contact with warmer air and water. The projected increase in air and water temperature, reduction in sea ice, and increase in height and frequency of storm surges are expected to have a destabilizing effect on coastal permafrost, resulting in increased erosion.

In the Alaskan village of Nelson Lagoon, residents have built increasingly strong break walls along the shore, only to see them destroyed by increasingly violent coastal storms. The village of Shishmaref, located on an island just off the coast of northern Alaska and inhabited for 4,000 years, is now facing the prospect of evacuation. The coastline along the North Slope is receding approximately 8 feet a year, more rapidly than coastlines in other parts of the world. As this process continues, loss of cultural and paleontological, soil, vegetation, and habitat resources would accumulate and would be irreversible within our lifetimes.

Contribution of Amendment Alternatives to Cumulative Effects

Most of the coastal area, from Atigaru Point to the boundary with the Northwest National Petroleum Reserve – Alaska, would be closed to leasing under the No Action Alternative. Lease Stipulation K-6, Coastal Areas, requires that permanent oil and gas facilities, including gravel pads, roads, airstrips, and pipelines established to support exploration and development activities shall be located at least ¾ mile inland from the coastline to the extent practicable. Where, as a result of technological limitations, economics, logistics, or other factors, a facility must be located within ¾ mile inland of the coastline, the practicality of locating the facility at previously occupied sites such as Camp Lonely, various Husky/USGS drill sites, and Distant Early Warning (DEW)-Line sites, shall be considered. Use of existing sites within ¾ mile of the coastline shall also be acceptable where it is demonstrated that use of such sites will reduce impacts to shorelines or otherwise be environmentally preferable. All lessees/permitees involved in activities in the immediate area must coordinate use of these new or existing sites with all other prospective users. Before conducting open water activities, the lessee shall consult with the Alaska Eskimo Whaling Commission, the Nuiqsut Whaling Association, and the NSB to minimize impacts to the fall and spring subsistence whaling activities of the communities of the North Slope. Adherence to this lease stipulation should ensure that coastal resources are adequately protected. All federal activities and federally-permitted activities must be reviewed for consistency with coastal management programs. Therefore, onshore activities within the Planning Area and some offshore activities identified under the alternatives should be assessed against the Alaska CMP, including the NSB CMP.

Conclusion

Effects on access to subsistence hunting and subsistence resources would offer the greatest opportunity for conflict with the statewide standards and the NSB policies related to these concerns. Increase in noise and disturbance from cumulative oil development would be additive and could have localized, short-term effects on some subsistence resources and access to some resources. Noise and disruption could be effectively addressed through lease stipulations and ROPs, existing regulations and management practices, coordination, and future permitting processes including federal, state, and local processes as applicable. Federal regulations require and implement strict oil spill prevention standards, and a large spill would be considered unlikely. In addition, the lease stipulations and ROPs would effectively address prevention and response relative to small and large spills. Conflicts with statewide standards of the ACMP and the policies of the NSB are not inherent in the scenarios assumed for this amendment.

4.7.7.16 Recreational Resources

In addition to the impacts described under the alternative's analysis, cumulative effects to recreational resources would result from past and future activities and facilities that affect solitude, naturalness, or primitive/unconfined recreation. Short-term or transient loss of the area's naturalness and solitude from such impacts as green pads/trails and noise from aircraft and equipment would not be cumulative. Therefore, their contribution to the cumulative impacts would be "momentary."

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Temporary structures (e.g., sleds, tents), vehicles (e.g., Rolligons, tractors), noise from generators, aircraft, human presence, and associated activity would have had short-term impacts on the experience of solitude, naturalness, or primitive/unconfined recreation. Because all of these identified non-oil and gas activities would have been transitory and short term, the likelihood of recreationists encountering them in any given location in the 57 million acre North Slope or in the 4.6 million acre Planning Area is probably small, unless recreation activities were centered around villages or oil and gas facilities, or occurred along major rivers and coastal areas.

A longer-lasting impact would have been from green trails resulting from overland moves. Green trails were created by vehicles compacting snow and dead vegetative matter that in turn results in the greater availability of moisture and nutrients for underlying vegetation the following growing season. These trails do not necessarily develop over the entire route of an overland move, but when they do they can be very detectable from the air for 2 to 5 years. They usually are difficult to recognize from the ground. Another impact along these trails that has occurred in the past is vegetation actually being damaged or broken or the tops of tussocks being scraped off. Though still relatively short term in nature, the linear nature of these trails emphasize the presence of man, which would have reduced the sense of naturalness and unconfined primitiveness to a small degree.

Oil and Gas Exploration and Development Activities

Seismic work has occurred over much of the ACP. This work resulted in a short-term impact on the primitive setting of the North Slope and a loss of solitude and naturalness. These impacts would have been confined primarily to the activity site viewshed or noiseshed, or approximately ½ mile in any direction. The potential effects on recreation opportunities and experience were minimized by the fact that very little winter recreation takes place in the area.

A longer-lasting impact occurred from green trails resulting from seismic survey operations. As with green trails created by overland moves, these trails do not necessarily develop over the entire survey route and are visible for about 2 to 5 years. Though relatively short term in nature, the linear nature of these trails would have emphasized the presence of man, which would have reduced the sense of naturalness and unconfined primitiveness to a small degree.

Other sources of potential recreation loss included exploration sites with gravel pads, disturbed areas around these pads, exploration airstrips, and gravel exploration roads. Based on a report by the NRC (2003), in 2001, approximately 1,200 acres had been impacted by these sites in the past, and 740 acres of disturbed areas were still evident. Most of these sites were developed before 1977, thus, their effects on the vegetative landscape have persisted for decades, and are likely to persist for several more decades.

Disturbances associated with exploration, development, and production activities continue to have a potential affect on the recreational experience. Temporary on-site location of structures (e.g., drilling rigs); noise from generators, vehicles, aircraft, etc.; human presence; and associated activity all would have short-term impacts on solitude, naturalness, and primitive/unconfined recreation experiences during the winter season. Through 2001, over 500 acres of peat roads still showed evidence of disturbance, even though most of these roads were constructed over 30 years ago. Gravel footprints had impacted over 9,200 acres, while gravel mines had impacted

another 6,360 acres of vegetation. Of this, all but 70 acres of gravel footprint persisted in 2001, but over 4,500 acres of gravel mines were reclaimed. Motorized traffic occurs along about 400 miles of roads (NRC 2003). These impacts to the recreation experience are greatest within a 2-mile radius of the facility, and for permanent, and some temporary, facilities, these effects persist today.

Wilderness Values

Past activities on the North Slope have reduced the naturalness of a portion of the Planning Area and reduced the area affording opportunities for solitude, personal challenge and unusual adventure, and primitive and unconfined recreation. In addition, effects on wildlife have degraded the wilderness experience potential to some degree.

Wild and Scenic River Values

During preparation of the Northwest IAP/EIS, 22 streams and rivers were found eligible for inclusion in the National Wild and Scenic Rivers System (USDOI BLM MMS 2003:V-165). However, no rivers were found suitable for inclusion.

Future Effects and Their Accumulation

Under the final Preferred Alternative, it is expected that long-term impacts over an area of approximately 205,000 acres would occur if oil prices were to average $25 per bbl. Considering past, present, and future development across the North Slope, total cumulative impacts would be additive and could affect an area three to five times greater. Even so, a vast area of the ACP—and certainly more than 80 percent of the North Slope and Planning Area—would remain relatively untouched. However, the types of development anticipated would not be uniformly distributed across the Planning Area or the North Slope, nor would recreational or wilderness values be perceived as uniformly dispersed. Cumulative impacts along popular rivers, such as the Colville River, would be seen as far more important than impacts elsewhere.

Wilderness Values

The cumulative development scenario for all alternatives would reduce the naturalness of a portion of the North Slope where non-oil and gas, and oil and gas development occur or are proposed, including the Planning Area, and Northwest and South National Petroleum Reserve – Alaska, and would reduce the area affording opportunities for solitude, personal challenge and unusual adventure, and primitive and unconfined recreation. In addition, effects on wildlife would degrade the wilderness experience potential to some degree. Nevertheless, most federal lands on the North Slope would remain roadless and would retain the characteristics necessary for future Wilderness designation if political support for such a designation were to coalesce.

Wild and Scenic Rivers

The Colville River and 22 other rivers in the National Petroleum Reserve have been identified as eligible for designation. The Colville River has not been found "suitable" because the BLM controls only the left bank (facing downstream), and neither the local population nor the State of Alaska support designation at this time. The right bank is controlled by the State of Alaska and the Arctic Slope Regional Corporation. These entities could authorize modifications such as airstrips, lodges, cabin sites, or storage facilities in the riparian area that would impact the scenic quality and the free-flowing, clean water nature of the river. Such modifications would make it very difficult to maintain the nondegradation standard of management if the Colville River adjacent to the Planning Area were found suitable for designation as a Wild River Area. Many of the rivers found in the Northwest National Petroleum Reserve – Alaska are in remote areas and would likely not be affected by development, or would be protected by lease stipulations and ROPs.

Effects of Spills

Most spills (65 to 80 percent) would be confined to a pad. Spills not confined to a pad usually are confined to the area immediately around the pad or pipeline. Therefore, impacts on solitude, naturalness, or primitive/unconfined recreation opportunities resulting from spills likely would be confined to the same area as described above.

A large spill that reaches a river, especially the Colville River, and moves rapidly downstream could have disastrous short-term (and possibly long-term) impacts on recreation values.

Global Climate Change

As discussed in earlier sections on Water Resources, Vegetation, Birds, Mammals, and Subsistence, global climate change could impact natural resources on the North Slope and have an effect on the recreation experience and types and timing of recreation activities that could occur.

Contribution of Amendment Alternatives to Cumulative Effects

Under the final Preferred Alternative, it is expected that long-term impacts over an area of approximately 205,000 acres would occur if oil prices were to average $25 per bbl. This would be about 2 times the area that would be affected under the No Action Alternative, but about 25 percent less area than would be affected under Alternative C. Considering past, present, and future development across the North Slope, total cumulative impacts would be additive and could affect an area three to five times greater. Even so, a vast area of the ACP—and certainly more than 80 percent of the Planning Area—would remain relatively untouched. However, the types of development anticipated would not be uniformly distributed across the Planning Area or the North Slope, nor would recreational or wilderness values be perceived as uniformly dispersed. Cumulative impacts along popular rivers, such as the Colville River, would be seen as far more important than impacts elsewhere.

Wilderness Values

The cumulative development scenario would reduce the naturalness of a portion of the Planning Area and would reduce the area affording opportunities for solitude, personal challenge and unusual adventure, and primitive and unconfined recreation under all alternatives. In addition, effects on wildlife would degrade the wilderness experience potential to some degree. Nevertheless, most of the Planning Area would remain roadless and would retain the characteristics necessary for future Wilderness designation if political support for such a designation were to coalesce.

Wild and Scenic Rivers

Although there are no designated Wild and Scenic Rivers in or near the Planning Area at present, the Colville River has been identified as eligible for designation, as discussed above.

Conclusion

Cumulative development activities would degrade the opportunities for primitive recreation in portions of the Planning Area and its surroundings. However, such opportunities would continue to be available over at least 80 percent of the Planning Area. Technically, there would not be cumulative impacts to Wilderness or Wild and Scenic Rivers because there are currently no such areas designated in the Planning Area. However, the area eligible for future designation would be reduced to the degree that a major disturbance occurred. Projected cumulative activities could have local impacts on the free-flowing, unpolluted waters and could affect the outstandingly remarkable values of portions of the eligible Colville River. In such a case, the amount of area potentially suitable for designation would be reduced.

4.7.7.17 Visual Resources

Activities associated with non-oil and gas activities (primarily development associated with villages, military [DEW-Line sites, cabins and campsites, and airfields), as well as inland oil and gas exploration and development and Beaufort Sea oil and gas development have resulted in cumulative effects to visual resources on the North Slope. Minor impacts to visual resources have also resulted from on-the-ground management activities, such as archaeological collection efforts, field camps, survey work, overland movements, and hazardous and solid material removal and remediation activities.

Past Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Most of the North Slope and Planning Area are still primarily a natural landscape where humans have not substantially changed the scenic quality. However, some areas have been modified by human activities. Buildings are the most likely to be seen and have the most modification from the natural landscape. The main areas where buildings exist near the Planning Area are Nuiqsut, Umiat, Camp Lonely, and Lonely DEW-Line site; other sites on the North Slope include Atqasuk, Anaktuvuk Pass, Barrow, Wainwright, and several other former military sites.

Landscape modifications associated with villages and temporary developments, including single family houses, temporary structures, (e.g., sleds, tents), roads, vehicles (e.g., Rolligons, tractors), commercial development, landfills, airstrips, and aircraft have some minimal short-term impacts on visual resources or scenic quality, by creating a contrast to the line, color, and texture of a primarily horizontal natural landscape. The colors of structures and equipment would contrast with the white color of the snow-covered landscape and the various hues of greens and browns, and the smooth texture of the facilities would contrast the varied textures of the windswept terrain and the irregular texture of vegetation. Non-oil and gas activities that occurred within the Foreground-Middleground Zone of the viewshed likely attracted the attention of the casual observer.

Other buildings found throughout the North Slope are cabins and camp structures associated with subsistence activities. These structures are usually isolated single-story small plywood cabins that produce some contrast with the surrounding landforms, but on a very local scale, along lakes, rivers, and creeks. One exception, however, is along the Miguakiak River and Teshekpuk Lake where structures are more clustered or present as "strip development."

Airstrips are located at five places within the Planning Area; airstrips are also located at villages, oil and gas fields, and Deadhorse. While the profile of an airstrip is low, landform changes are introduced by brown colors in predominantly green vegetation and more regular lines than the surrounding irregular vegetation.

Capped wells (called Christmas trees) dot the landscape. However, given the small footprint and most being less than 6 feet tall, these modifications are very hard to see unless you are within a couple hundred feet of them.

Permanent roads are primarily associated with the TAPS, local communities, and the oil fields road network. As of 2001, there were approximately 400 miles of oil field roads, about 75 percent of which were constructed by the early 1980s. These roads can be visible from a mile or more away. Very few trails exist very far from any community. Summer travel is primarily by watercraft along rivers and coastal areas. Some areas around Nuiqsut receive travel by ATV, however, these trails are hard to see from more than about 25 feet away. Ice roads are used during the winter months and leave changes in vegetation colors during the summer, but again, this contrast is very hard to see from more than a few feet away.

While these areas introduce modifications to the landform, they also provide places of use and special interest or key observation areas from which to evaluate the sensitivity levels.

A longer-lasting impact has been the green trails resulting from winter overland moves. Green trails form when vehicles compact snow and dead vegetative material, resulting in a greater availability of moisture and nutrients for

underlying vegetation the following growing season. These trails did not necessarily develop over the entire route of the overland move. Vegetation has been damaged along these trails and the tops of tussocks have been scraped off. Green trails are visible for about 2 to 5 years. However, because they visually modified existing vegetation, rather than adding something foreign into the viewshed, green trails have not produced much contrast to line, form, or texture. The color contrast would be minimal from ground view because of the natural variation in hue, and would be almost nonexistent from more than a few hundred feet away.

Drill rigs (average height of 208 feet) have introduced strong vertical lines into a predominantly horizontal landscape. Because they are painted red, most drill rigs also produce a strong visual contrast to the white background of the snow-covered landscape. Winter drilling requires lighting, which creates a visual contrast against the dark night sky.

Oil and Gas Exploration and Development Activities

Past development and production of oil and gas has cumulatively impacted about 17,500 acres from surface disturbance associated with roads, pads, and exploration sites; about 12,000 acres of surface impacts are still visible today (NRC 2003). In addition, about 400 miles of pipelines have been constructed at one time or another. Visual impacts from oil and gas facilities and activities have changed the existing landscape from a very natural viewshed to a more industrialized setting introducing vertical lines, regular patterns, and varied colors. From some viewpoints, it is possible that multiple developments could be seen in the Foreground-Middleground Zone, as well as the Background Zone and Seldom-Seen Zones of the same viewshed. These visual effects persist today, and unless sites are dismantled and rehabilitated, would accumulate with future effects.

Future Effects and Their Accumulation

Activities Not Associated With Oil and Gas Exploration and Development

Cumulatively, the non-oil and gas activities that would occur on the Arctic North Slope would be the same as those described under Alternative B. However, green trails and temporary camps would increase as a result of, or in support of, oil and gas development. For example, field activities associated with archeological site clearances (such as camps, excavations, and aircraft activity) would all likely increase.

Although the amount of supplies and materials transported by winter overland moves would increase with additional activity on the North Slope, these moves would generally follow the same routes. New trails could be developed to reach new staging areas and pump stations; however, once a route was identified, numerous trips over the route could occur without additional impacts.

Oil and Gas Exploration and Development Activities

Cumulatively, seismic-survey work would continue, with the number of operations increasing each winter season. These operations could result in hundreds of miles of intermittent green trails, visible from the air during any one summer season. As production of fields increased, seismic work would tend to decrease and green trails would reduce in number and recover naturally.

Present development and production could impact less than 1 percent of the North Slope, while reasonably foreseeable future development could impact around 1 percent of the North Slope area. However, remediation of old drill sites is ongoing, and many of the impacts have a natural recovery rate of less than 15 to 20 years. The ring effect from old well sites would also naturally recover in less than 15 to 20. Exploration wells would leave behind a marker pipe expected to be no larger than a square foot on the surface and 6 feet tall. This impact would essentially be permanent, although it would be almost unnoticeable from several hundred feet away.

In addition to the impacts that have resulted from ongoing exploratory drilling operations, the greening of vegetation under vacated ice pads, ice airstrips, and ice roads has caused impacts to visual resources during the summer. This greening of vegetation is caused by the same conditions that create green trails, a greater availability

of moisture and nutrients as ice or compacted snow melts. There has also been a "ring effect" around ice pads, ice airstrips, and ice roads caused by the death of vegetation adjacent to these snow and ice structures. The effects of ice roads and pads are short-term, however, and would not accumulate.

Visual impacts from oil and gas activities would continue to become more noticeable as production pads, staging areas, CPFs, roads, gravel mine sites, airstrips, and pipelines change the landscape. In many areas, the increase in development and production would change the existing landscape from a very natural viewshed to a more industrialized setting introducing vertical lines, regular patterns, and varied colors. From some viewpoints, it is possible that multiple developments could be seen in Foreground-Middleground Zone, as well as the Background Zone and Seldom-Seen Zones of the same viewshed.

A road from the Spine Road across the Colville River to Nuiqsut would impact visual resources along its route. The scenic quality along the route would be affected by the removal of native vegetation and the use of gravel, sand, and other road materials where they are not naturally located. The development of material sources (e.g. gravel pits) could have an impact on the visual quality of the adjacent area. Traffic along the route would impact the visual quality from the surrounding area. If the road is opened up to the public, it would allow more of the public to see and enjoy the natural landscapes.

Effects of Abandonment and Rehabilitation. During abandonment and rehabilitation activities, vehicle traffic on roads would create short-term noticeable visual impacts through the creation of fugitive dust. Once closure activities are completed, the strong contrasts with the surrounding vegetation colors created by structures, such as pipelines and buildings, would be eliminated.

Effects of Spills. Most spills (65 to 80 percent) would be confined to a pad. Spills not confined to a pad would usually be confined to the limited area immediately around the pad or pipeline. Thus, there would be no new visual impacts associated with spills.

Global Climate Change

As noted in earlier sections on soil, vegetation, and water, changes in global climate may influence coastal erosion rates, amount of surface water, stability of the soil, and amounts and types of vegetation on the North Slope. All of these effects would have an impact on the visual characteristics of the North Slope and Planning Area.

Contribution of Amendment Alternatives to Cumulative Effects

Under the alternatives, seismic surveys would continue. There would be about 250 miles of 2-D surveys and two to five 3-D surveys for each alternative. Seismic work would occur in the winter using cat trains with low-ground-pressure vehicles supported by light aircraft. Seismic crews would be housed in mobile camps consisting of a train of trailer sleds pulled by tractors. These moving camps and associated activities would result in short-term impacts on visual resources and the scenic quality of the area by creating a color contrast between the vehicles and trailers and the predominantly white background of the snow-covered landscape. These impacts would be confined primarily to the activity-site viewshed.

Green trails resulting from seismic survey operations would result in a longer-lasting impact to visual resources and would be similar among alternatives. Unlike overland moves, seismic operations would not follow the same routes every year, and the number of miles of survey line could vary greatly from year to year. In some years, no surveys would occur. Like green trails caused by overland moves, trails caused by seismic operations would not necessarily develop over the entire survey route, but where present would be visible for about 2 to 5 years. Because green trails visually modify existing vegetation, they would not produce much contrast to line, form, or texture. The color contrast would be minimal from ground view because of the natural variation in hue, and would be almost nonexistent from more than a few hundred feet away.

Approximately 25, 75, 91, or 60 exploration and delineation wells would be drilled under alternatives A through D, respectively, at an oil price of $25/bbl. It is estimated that the long-term disturbance associated with the new wells

would be about 10 acres per well. Given the limited number of drilling rigs available, however, no more than three drilling rigs would likely be operating at any one time. Assuming approximately 50 acres of ice pads, airstrips, and roads per drill site, as many as 1,250 (Alternative A) to 4,550 (Alternative C) acres would be in various states of recovery from greening and ring effects under the alternatives.

It is estimated that long-term surface disturbance from pads, roads, airstrips, gravel pits, and CPFs would range from about 300 acres under the No Action Alternative to 1,120, 1,380, and 920 acres for alternatives B through D, respectively. Pad sites generally contain one-story buildings and pipelines. The tan gravel pads would generally be only 3 to 5 feet above the surrounding green tundra, and would be relatively unnoticeable beyond a few thousand feet. Facilities would introduce strong vertical lines from buildings into the landscape of predominately soft horizontal lines. There would also be a visual contrast between the simple, regular form of the buildings and the complex, irregular forms of the vegetation. Colors of buildings and materials would contrast with the greens, browns, and blues of vegetation and water bodies. Some of the buildings could be up to three stories in height above the tundra, and would attract and dominate the view of the casual observer if located within the Foreground-Middleground Zone.

It is anticipated that as many as 110 (No Action Alternative) to 330 miles (Alternative C) of pipeline, impacting up to 660 to 1,980 acres (5 to 6 acres per mile), would be constructed. There would be no on-the-ground activities associated with pipelines, except during construction and repair. Pipelines would introduce shiny and smooth horizontal lines into the naturally irregular brown and green landscape. They would also introduce regularly spaced vertical supports into an irregular horizontal landscape. Pipelines would be elevated at least 5 feet above the surrounding tundra, but could be elevated as high as 20 feet above ground level. At these elevations, the pipeline would attract the attention of the casual observer if located within the Foreground-Middleground Zone.

Other facilities associated with development would include gravel mine sites, bridges, roads, airstrips, and communications towers. Disturbance associated with gravel mine sites would generally occur below the ground surface, with only stockpiled materials being visible aboveground. While these sites could be large in size or footprint, very little material would remain as stockpile at any one time. If located within the Foreground-Middleground Zone, only bridges, because of their contrast with smooth water bodies, and communications towers, because of the vertical height above the horizon, would be likely to attract the attention of a casual observer.

Visual Resource Management Classes. Visual Resource Management classes were not established in the 1998 Northeast IAP/EIS. It is BLM policy that interim Visual Resource Management classes are established when a project is proposed for which no VRM objectives have been approved. Using scenic quality, sensitivity, and distance zones as well as other management factors, the Alpine field area would be assigned three VRM classes. The Colville River, from the southern project boundary to Harrison Bay, including the Delta area, would be VRM Class II. Fish Creek, Judy Creek, and the Tingmiaksiqvik River would be VRM Class III. The rest of the project area would be VRM Class IV.

The 1998 Northeast IAP/EIS ROD assigned VRM classes to the Colville River. The Colville River Special Area will be managed for VRM Class I upstream of Umiat and VRM Class II below Umiat, with exceptions allowed for subsistence structures and essential pipeline crossings.

The Northwest IAP/EIS ROD assigned VRM classes as follows: The lands along the Colville River area are designated VRM Class I. Identified estuarine areas and lands along the 21 rivers eligible for designation as Wild and Scenic Rivers are designated VRM Class II. All lands within 3 miles of the banks of all identified water bodies are designated VRM Class III. The remainder of the Northwest National Petroleum Reserve – Alaska is designated VRM Class IV.

Conclusion

There would be a small increase in the short-term impacts to visual resources from non-oil and gas activities. Short-term impacts, such as green trails, and ongoing activities would not accumulate. Impacts from long-term or

permanent facilities such as roads, pipelines, and gravel pads and pits would accumulate and would result in the long-term loss of scenic quality.

Long-term impacts from production sites, staging areas, and pumping stations with a possible life span of over 30 years would affect visual resources in the North Slope. It is expected, however, that these impacts would be greatest within the Foreground-Middleground Zone of the viewer. Pipelines could be elevated above ground level and would be visible from ½ mile or more away. Except during construction and repair of pipelines, there would be no associated on-the-ground activity. Therefore, long-term impacts to visual resources from pipelines would be expected to be minimal if located beyond the Foreground-Middleground Zone of the viewer.

4.7.7.18 Economy

Introduction

This section addresses the cumulative effects of past, present, and future activities on the economy of the North Slope. The economy of any area is ultimately global in scale, however, the focus of this assessment is on the entire NSB economy, although some influences on the economy may be more localized and only affect one or two communities within the NSB. Four primary indicators are used to assess cumulative effects on the economy. These four indicators are NSB revenues, jobs, population, and per capita income. Since subsistence is an important part of the local economy, it is also discussed in this section. Section 4.7.7.12 (Subsistence) provides the primary discussion of cumulative effects on subsistence. Key events or factors are described, followed by an analysis of these events, and a discussion of the trends that have affected the economy and are expected to continue into the future.

Past Effects and Their Accumulation

Key Events/Factors

As shown in Figure 4-4, the following subsections describe some of the major economic events or factors that led to the present situation, those situations and trends that are anticipated to continue into the future, and reasonably foreseeable future events that would affect the economy.

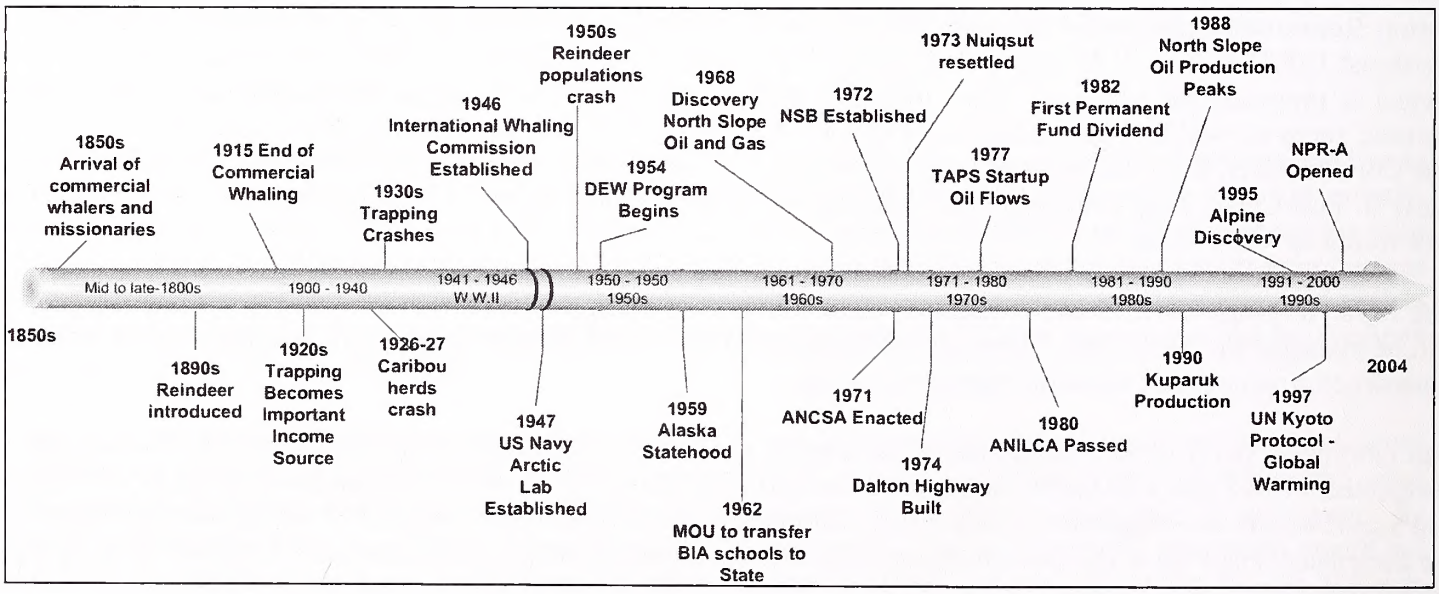


Figure 4-4. Major Events Affecting the North Slope Economy, 1850 –2004.

Any discussion of the economy of the North Slope must recognize that subsistence was, and continues to be, the basis of the economy and culture for the Iñupiat people. The assessment of past events begins with the advent of

commercial whaling in the 1850s, which is considered the first major event that affected the North Slope economy, and ends with current (2004) oil and gas lease sales that could affect the future economy of the region.

Commercial whalers entered the Chukchi and Beaufort seas in the 1850s, pursuing whales for oil and baleen. Protestant missionaries soon followed, establishing churches in several historic village sites along the coast. Whaling captains hired North Slope Natives as crew members and eventually these Natives became captains of their own ships. In the 1890s, the Bureau of Education introduced reindeer into the region, providing additional food for the herders and a needed source of cash when sold for their meat to whalers and others. By 1915, the overharvest of bowhead whales and the development of substitutes for baleen and whale oil led to the end of commercial whaling.

By the time commercial whaling ended, the cash economy was well integrated into the North Slope economy and other sources of income were needed to compensate for the loss of whaling income. Trapping became an important source of income for the region until the Great Depression brought a substantial decline in demand for furs. In the mid- to late 1920s, the caribou populations crashed and the bands of Iñupiat living in the Brooks Range dispersed to other areas, not returning to the mountains until the late 1940 and 1950s.

World War II saw the development of airports around the state, and North Slope residents were involved as Army Scouts. Few other events of major significance occurred during this period. After World War II, the International Whaling Commission was established and the U.S. Navy built its Arctic Research Laboratory near Barrow. The Navy also began its early petroleum exploration on the North Slope. Both of these activities provided steady employment in the region. As the Cold War evolved, and the threat of nuclear war emerged, the Department of Defense began to build the DEW-Line radar sites along the Alaska coastline from 1955 to 1957. This construction activity and operations provided some employment for local residents.

Alaska became a state in 1959, and by 1962 an MOU was signed to transfer Bureau of Indian Affairs schools to the state; however, many Bureau of Indian Affairs schools continued to exist in the state until the early 1980s.

As pointed out by the NRC (2003), the discovery of oil in 1968 at Prudhoe Bay "accelerated political processes for resolving complex issues of land tenure and rights...." The Alaska Native Claims Settlement Act (ANCSA) established the ASRC and the village corporations in 1971, and led to the formation of the NSB in 1972, as well as the resettlement of the villages of Nuiqsut in 1973 and Atqasuk in 1974.

The Dalton Highway opened in 1974 and the first oil flowed down the TAPS in 1977, providing a wealth of revenues to the State of Alaska and the NSB, with the first Permanent Fund Dividends paid to residents of the state in 1982. The ANILCA in 1980 established the network of national parks, refuges, wilderness areas, preserves, and other federal land ownership that exists today on the North Slope.

Peak oil production from the Prudhoe Bay field was reached in 1988 and production began to decline. Production from the Kuparuk field started in 1990, after there was sufficient capacity in the TAPS to accept more oil. The petroleum industry had limited exploration success after the early discoveries in the late 1960s and early 1970s, until the discovery of the Alpine field in 1995. Alpine, located near the eastern boundary of the National Petroleum Reserve – Alaska, represented a new geologic concept for oil reservoirs on the North Slope and provided further impetus for opening the Reserve to exploration to private companies.

Revenue

Aside from the petroleum industry, the NSB is the dominant economic organization on the North Slope. The NSB taxes the oil and gas facilities and uses the revenues to provide education and a wide array of other public services within its boundaries. Property taxes on oil and gas infrastructure provide over 95 percent of the total revenues received by the NSB. The value of the infrastructure is based on the estimated value of the profits that can be generated with these facilities. As the amount of oil reserves remaining in the ground declines over time, the value of the facilities also diminishes, followed by subsequent reduction in the property taxes generated. The NSB has

used its taxing authority to issue bonds that are used for capital improvement projects and has pledged much of its future revenues to pay for these projects. The NSB must meet its debt service requirements on these bonds even if oil and gas property taxes decline, thus the result can be a substantial decline in operating budgets if tax revenues are diminished.

Prudhoe Bay and Kuparuk were the largest and second-largest fields discovered in North America. Even though theses fields are in decline, they still produce a significant portion of the total oil production on the North Slope. As new fields are brought on line, the profit generating potential of those facilities is recognized with associated changes in the property taxes that can be generated. Figure 4-5 shows the change in oil and gas property taxes received by the NSB from 1975 through 2003. Installation of new facilities and development of new fields can result in periodic upturns in the amount of oil and gas property taxes, but the trend of declining oil and gas property taxes is anticipated to continue in the long term. If a gas pipeline were built, however, it is expected that there would be a substantial shift upwards in NSB oil and gas property taxes; in the absence of a gas pipeline, the current downward trend would likely persist.

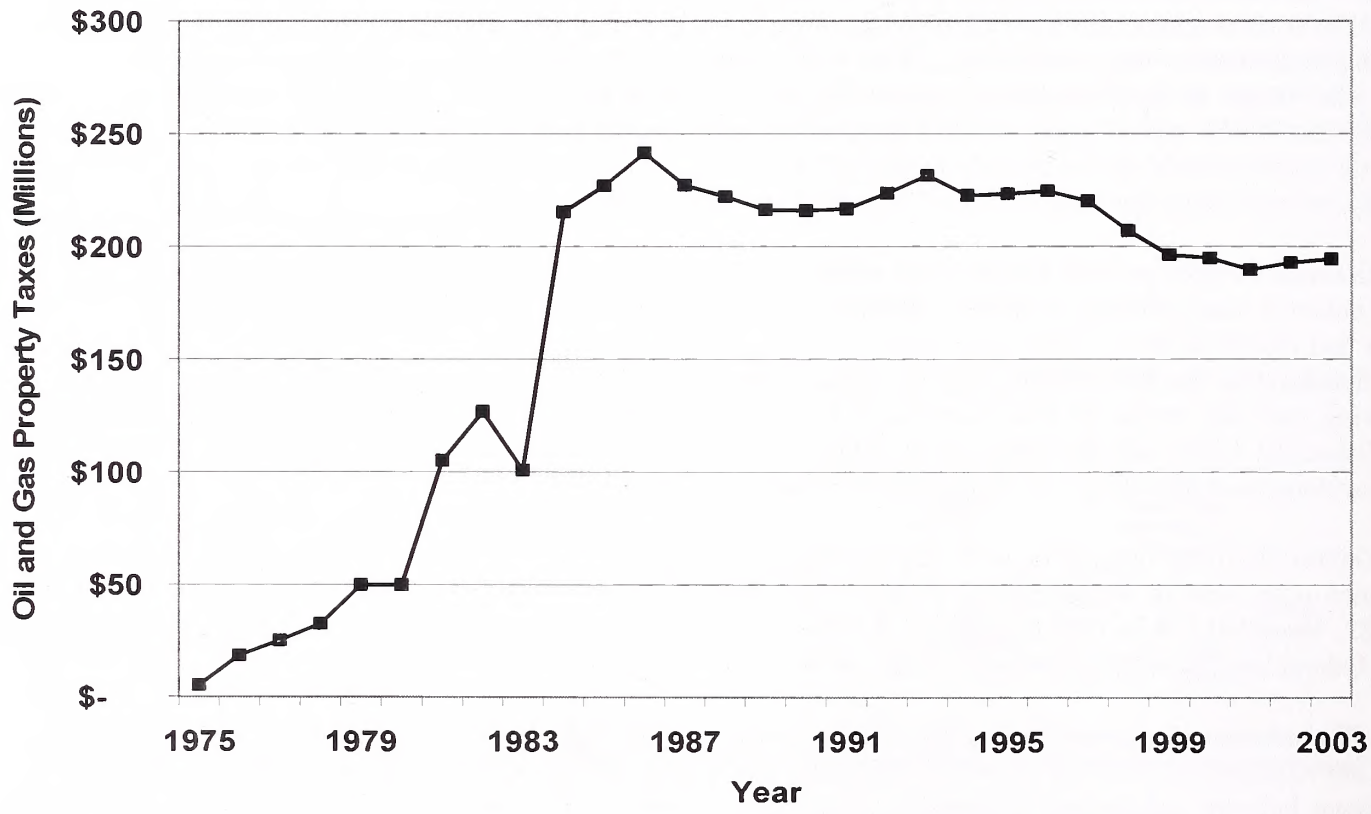


Figure 4-5. North Slope Borough Oil and Gas Property Taxes, 1975 – 2003.

Jobs

As evidenced by Figure 4-6, without the discovery of oil at Prudhoe Bay in 1968, the number of jobs that would be available for North Slope residents would be substantially fewer than presently exist. Although most of the oil and gas-related jobs are held by people that reside outside of the NSB, jobs funded by the NSB's property tax revenues account for the vast majority of the remaining jobs (outside of the oil and gas sector). The number of jobs in the oil and gas-related sector has fluctuated with the development of new fields, and the development and end of construction of new, large fields (e.g., Kuparuk and Alpine) is evident. This volatility in employment is expected to

continue, and the success of the petroleum industry in finding new commercial fields will be a large factor in future employment levels.

The decline in NSB associated employment is evident from information provided on the Alaska Department of Labor's web site. In 2003, average annual monthly employment in the construction industry was only 171 jobs, the lowest number of construction jobs since employment records by industrial sector for the NSB became available in 1980. Local government employment also declined to 1,838 jobs, the lowest level since 1992.

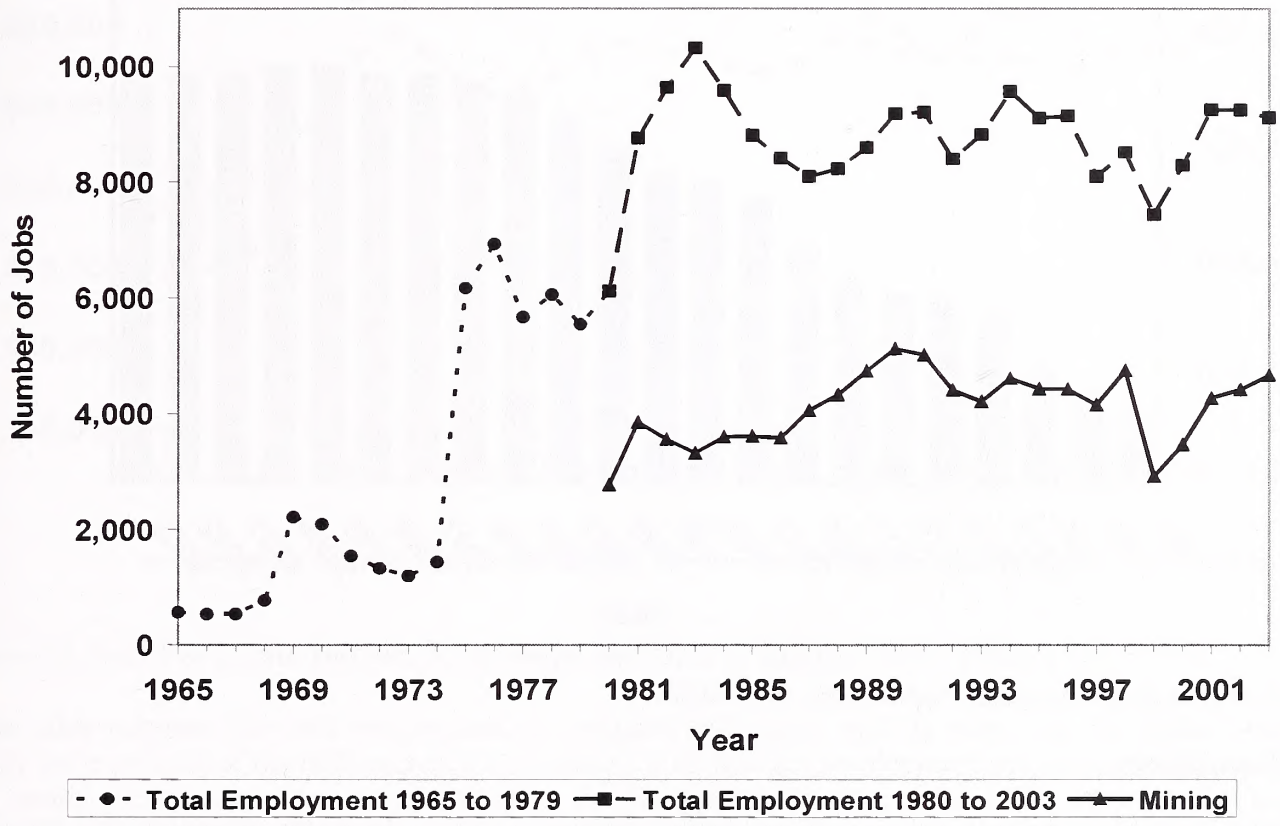


Figure 4-6. North Slope Borough Employment, 1965-2003.

Population

The population of the NSB has increased substantially over the past 6 decades, partly in response to increased employment opportunities and as the result of improved living conditions and increased life expectancy rates for Iñupiat people. However, as shown in Figure 4-7, population growth in the NSB has slowed significantly over the past several years and has declined for four straight years since 1999. The reduction in jobs supported by the NSB has likely resulted in the emigration of residents who are seeking employment opportunities, since few NSB residents are employed in the North Slope oil industry, and a reduction in the number of people migrating into the NSB for employment opportunities.

Per Capita Personal Income

As shown in Figure 4-8, real (inflation adjusted) per capita personal income in the NSB has declined from peak years in the 1970s and early 1980s, with over $40,000 in income, to under $30,000 in income in the latter part of the 1990s. In comparison, per capita personal income for the state remained between $25,000 and $30,000 from the 1970s through the early 1980s, and has remained relatively stable from the early 1980s through the end of the last

decade. Since 2000, per capita personal incomes in the NSB rose to about $35,000. Incomes across Alaska also rose since about 1997, reaching new historic highs in 2001 and 2002. Much of this recent increase is due to direct Congressional appropriations that have occurred as a result of Senator Stevens's role as Chair of the Senate Appropriations Committee and as a result of the emigration from the NSB (slight increases in total income divided by fewer people result in larger increases in per capita income).

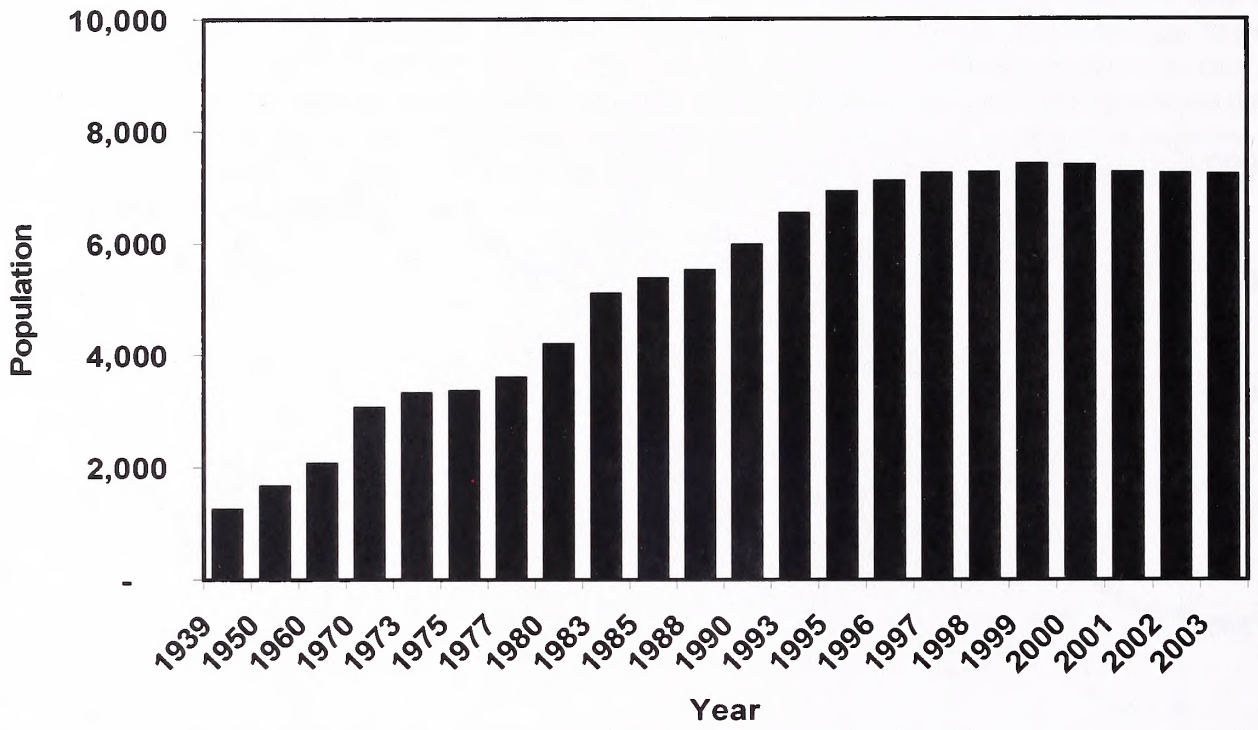


Figure 4-7. North Slope Borough Population, 1939-2003.

Subsistence

Iñupiat tend to begin their time allocations with wage labor decisions and then divide the remaining time between subsistence and leisure. In other words, North Slope residents tend to allocate relatively less time to subsistence as they increase their employment time.

Increased income has led to the adoption of more efficient, reliable, useful, and less-demanding subsistence technology. For example, those with financial resources frequently counterbalance limited leisure time by using motorized equipment (e.g., three-wheelers, snowmachines, and outboard motors for boats) to reduce travel time. The widespread use of these modern modes of transportation also makes it possible for large numbers of people to concentrate in a single settlement and still hunt and fish over a large area. However, the adoption of modern technology raised the cost of participating in subsistence activities in the NSB given the lack of low cost transportation links where few goods and services escape a substantial transportation premium.

Being employed part-time appears to be complementary to subsistence participation. For example, if a person works part of the year, a small decrease in employment time increases the amount of time for subsistence activities and raises subsistence hunting or fishing effort. On the other hand, extended underemployment or unemployment represents a major impact that could sharply reduce wage income. This wage reduction, in turn, diminishes the individual's ability to participate in subsistence because they may not be able to acquire the necessary capital inputs (for example, snowmachine, boat motor, ammunition, and gasoline). In other words, extended underemployment or complete job loss may produce income loss-related effects that overwhelm those associated with more leisure time. The recent reduction in construction employment, which is the primary occupation for

many male Iñupiat in the villages, could make it more difficult for these individuals to participate in subsistence activities and provide, by subsistence activities, for their families and community.

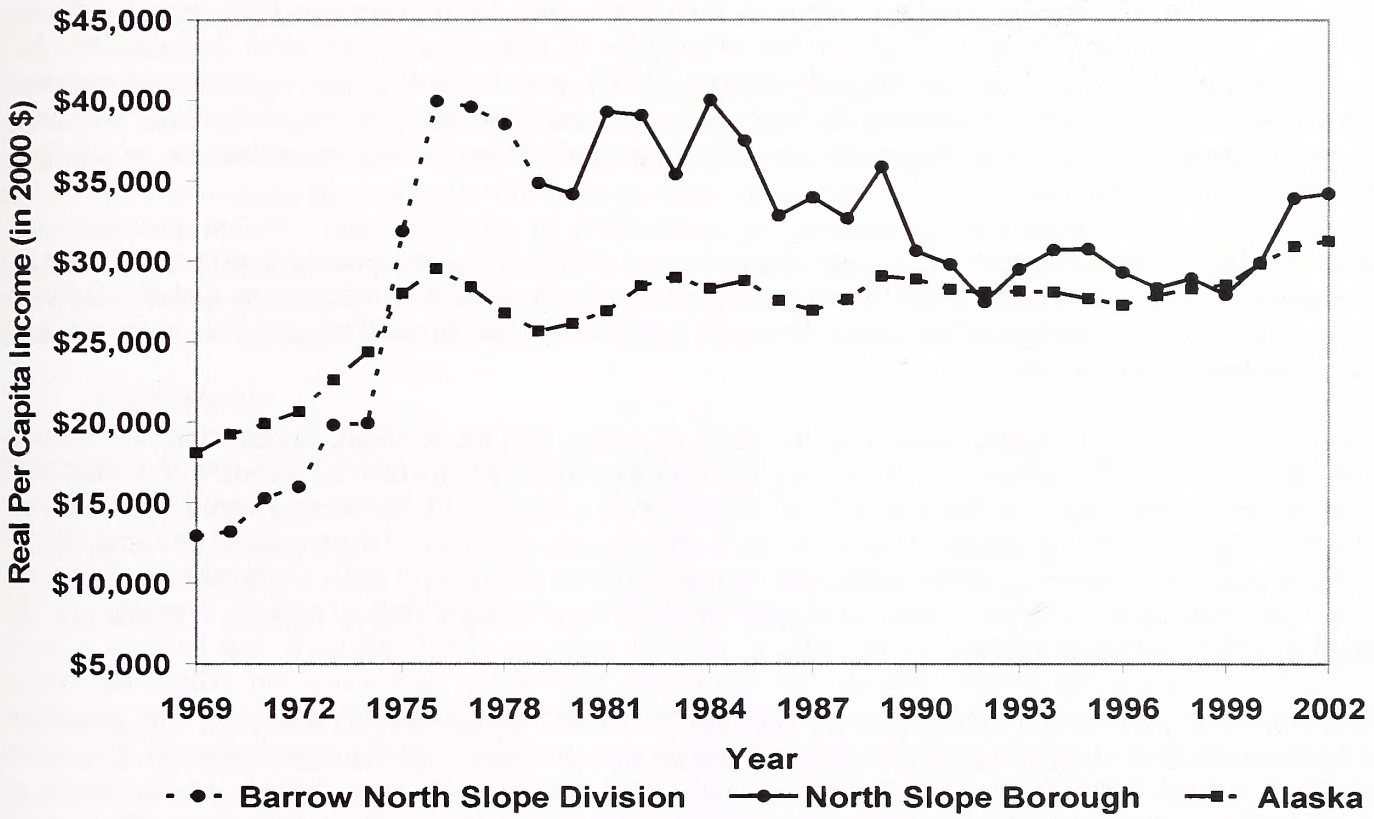


Figure 4-8. Real Per Capita Income, North Slope and State of Alaska, 1969 – 2002 (Year 2000 $).

At the other extreme, full-time employment also reduces subsistence activity even with the liberal subsistence activity leave policies of the NSB and other companies. If oil and gas development and production in the Planning Area would provides employment opportunities for Nuiqsut residents or other NSB residents, the additional income could help pursue subsistence activities, but the opportunities are not expected to be sufficient to offset the declines from other fields.

Summary of Past Effects and Their Accumulation

Subsistence was, and continues to be, the basis of the economy and culture for the Iñupiat people. The assessment of past events begins with the advent of commercial whaling in the 1850s, which is considered the first major event that affected the North Slope economy, and ends with current (2004) oil and gas lease sales that could affect the future economy of the region. Aside from the petroleum industry, the NSB is the dominant economic organization on the North Slope. The NSB taxes the oil and gas facilities and uses the revenues to provide education and a wide array of other public services within its boundaries. Property taxes on oil and gas infrastructure provide over 95 percent of the total revenues received by the NSB. Population growth in the NSB grew sharply until the mid-1980s, and then has slowed significantly over the past several years and has declined for four straight years since 1999. Real (inflation adjusted) per capita personal income in the NSB has declined from peak years in the 1970s and early 1980s, with over $40,000 in income, to under $30,000 in income in the latter part of the 1990s. Increased income has led to the adoption of more efficient, reliable, useful, and less-demanding subsistence technology. However, full-time employment reduces the amount of time available for subsistence activities.

Future Effects and Their Accumulation

Key Events/Factors

The BLM, MMS, and the State of Alaska continue to hold lease sales for onshore and offshore oil and gas exploration in Alaska. However, the response of the oil industry to these recent lease sales demonstrates the industry's recognition of the high cost and high risk of exploration in areas located far from current infrastructure. While some exploration activities are occurring far from current production areas, most exploration is located near existing infrastructure in order to reduce costs or exploration and achieve a higher probability of finding economically viable reserves.

The Alpine satellite fields are examples of this type of exploration activity. Colville Delta-3 (Fjord) was discovered approximately 6 miles north of Alpine, and CD-4 (Nanuq) was discovered about 4 miles south. Colville Delta-5 (Alpine West) is about 3 miles from CD-2, CD-6 (Lookout) is about 10 miles from CD-5, and CD- 7 (Spark) and CD-6 are separated by about 6 miles.

Fjord and Nunaq are located on lands owned by the State of Alaska and the Kuukpik Corporation, the Alaska Native village corporation for Nuiqsut. The subsurface rights to the oil and gas are held by the State of Alaska and ASRC. A similar situation exists for the Alpine field. Alpine West is proposed to be located within the National Petroleum Reserve – Alaska, on Kuukpik land and an ASRC oil and gas lease. The royalties to ASRC from production of these fields would generate substantial revenues for the corporation and its shareholders. Seventy percent of these petroleum royalties would be shared with the other Alaska Native regional corporations in accordance with Section 7(i) of ANCSA.

Reasonably foreseeable events that would affect the economy of the NSB include actions associated with future oil and gas lease sales and other activities in the northeast and northwest portions of the National Petroleum Reserve – Alaska, natural gas, hard rock minerals and coal exploration and production in the southern portion of the National Petroleum Reserve – Alaska, and subsequent leases and exploration and production from state and ASRC-owned lands in proximity to the National Petroleum Reserve – Alaska. In the absence of a natural gas pipeline, it is anticipated that revenues to the NSB would continue to decline with subsequent adverse effects on the ability of the NSB to provide the number of jobs that it has in the past.

Revenue

The current downward trend in declining oil and gas property taxes, accounting for over 95 percent of the revenues received by the NSB, is expected to continue is the absence of a gas pipeline. Potential oil production from recent and future lease sales in the National Petroleum Reserve – Alaska could help to slow this decline, but is not expected to reverse the trend.

Jobs

As oil fields mature they typically require more employees per unit of production, so even though profits and property taxes may decline, employment in the oil and gas sector may remain constant or even increase slightly. However, in the government sector and other sectors funded primarily by the NSB's property tax receipts, employment is expected to decline as property taxes decline. Employment in the oil and gas sector could remain within the range of employment levels experienced between 1980 and 2003, while the number of jobs supported by the NSB's property tax revenues is expected to decline in concurrence with the reduction in tax receipts cited above. Current and future lease sales on the North Slope could help to mitigate some of these employment losses, but are not expected to offset them.

Population

The NSB population is not expected to increase if additional jobs cannot be created, or if NSB residents cannot acquire the training and experience necessary to obtain jobs in the oil industry. While short-term population

declines may occur, it is anticipated that over time the NSB and other organizations would develop training programs and undertake other activities to provide NSB residents with the necessary skills and experience to work in the local oil industry.

Per Capita Income

The recent increase in per capita income is expected to continue through 2005, and then level off or decline slightly as Senator Stevens's new committee position could have less influence on the congressional budget. Future changes in employment opportunities and migration of NSB residents would also affect this indicator. The longer-term trend in decreasing per capita income may continue unless NSB residents seek opportunities in the North Slope petroleum industry. The availability of employment opportunities in the Planning Area, with development and production of known and potential oil fields, could increase employment opportunities for Nuiqsut residents who live in close proximity to these fields. While wages associated with this employment could raise the per capita income for Nuiqsut residents, it would likely represent a very small increment for the NSB.

Subsistence

Participation in the cash economy has changed expectations of NSB residents about the quality of life in their communities compared to several decades ago. However, as construction jobs in the villages diminish with the reduction in the NSB's capital improvement program, it could become more difficult for some residents to continue their same level of participation in subsistence activities and maintain their quality of life. When faced with a situation of fewer jobs and less income, village residents have a choice of reducing their quality of life by spending more of their available income on food and less on other items, focusing on subsistence activities that require less capital, but which may not provide the variety and quantity needed, seeking work outside of the community, and moving away from the community to seek employment opportunities elsewhere. None of these options may be appealing to village residents whose circle of family and friends is centered in the community. In the absence of subsistence activities, residents would have few alternatives, but to leave or seek employment outside of the community. Employment opportunities and taxes and royalties paid by potential development in the Planning Area would help mitigate the decline in NSB revenues, but are not anticipated to be enough to offset the decline from other fields.

Global Climate Change

The Kyoto Protocol on global climate change was signed in 1997. Under the protocol, developed nations agreed to limit their emissions of greenhouse gases. The United States has yet to ratify the treaty and as a result, there is a great deal of uncertainty regarding the implementation of the protocol and its potential effects on energy production and consumption in the U.S.

Contribution of Amendment Alternatives to Cumulative Effects

The combined average annual property taxes to the NSB and State of Alaska from future oil development in the Planning Area could range between $5.4 million (No Action Alternative) and $24 million (Alternative C) depending on the price of oil and the resulting infrastructure development. The estimated annual royalty and severance payments would range from $13 million to $79 million for the federal government, $6.5 million and $39.4 million for the NSB, and $6.5 million and $39.4 million for the state government. Moreover, annual severance taxes estimated to be generated would range from $22 million to $131 million.

It is anticipated that employment would increase in the range of 78 to 407 jobs during the peak of development and 9 to 52 jobs during production.. The annual employment of Alaska residents (excluding residents of the NSB) would increase in the range of 1,109 to 5,798 jobs in the peak of development, and 396 to 2,386 jobs during production.

The proximity of Nuiqsut to the Planning Area enhances the community's opportunities to benefit from development and production activities associated with the final Preferred Alternative. These opportunities could

extend to community businesses that might provide goods and services, as well as residents who might obtain work as a result of the development and production activities.

Conclusion

Subsistence activities (non-cash economy) and the oil and gas industry (cash economy) are the primary factors that affect the economic livelihood of the North Slope residents. The NSB has successfully leveraged tax revenues generated from oil and gas properties to improve the quality of life of its residents by providing basic services such as water, sewer, electricity, fire protection, police protection, education, health services, and by building infrastructure to support these services through capital improvement projects. Construction jobs associated with the NSB's capital improvement projects have provided residents with employment opportunities that pay relatively well and allow for flexibility to accommodate subsistence activities.

As expected, property tax revenues have decreased through the years, as oil and gas production decline and facilities continue to depreciate. Correspondingly, historical employment data indicate a declining trend in the number of jobs in the North Slope. The declining trend in revenues, jobs, and per capita incomes are expected to continue into the future (absent a major economic event such as the natural gas pipeline project that would create a natural gas industry). It seems reasonable to envision a future trend with more North Slope residents participating in oil and gas activities as Borough-related employment opportunities become very limited. This could mean a tradeoff in subsistence activities as jobs in the oil and gas industry would not be able to provide the same level of flexibility as the Borough and construction jobs.

Events in the reasonably foreseeable future, such as exploration and development in other areas of the National Petroleum Reserve – Alaska, could mitigate these declining trends, but are not expected to offset these declines. The development associated with the Northeast National Petroleum Reserve – Alaska could also have implications at the national level. The Department of Energy estimated that the contribution of North Slope crude to domestically produced oil supplies would decline from 18 percent in 2004 to 14 percent in 2020; again, this decline could be mitigated, but not offset, by opening up the Northeast National Petroleum Reserve – Alaska to oil and gas exploration. Any increase in domestic oil production is expected to reduce U.S. dependency on foreign oil supplies, and, in turn, improve national energy security and the overall balance of trade.

4.7.8 Incremental Contribution of Alternatives to Cumulative Effects

For this cumulative effects analysis, the incremental contribution of an alternative to cumulative impacts is assumed to be proportional to the projected level of activities for that alternative. In general, the likelihood of interaction between oil and gas activities and surface resources is related to the number of activities that occur. However, if an action occurred in an area with a high resource value, for example, in an area with a high density of nesting eiders, effects to the resource could be much greater than predicted based on the number of activities or their projected area of impact.

The incremental contribution to cumulative effects would be greatest under Alternative C because the highest levels of activities and the greatest volume of production are projected under that alternative. Alternative C would also make the most area available for leasing. With consideration of the variables and factors above, Alternative C is projected to contribute approximately 10 to 15 percent to the overall cumulative impacts to the resources addressed in this amendment.

Under the final Preferred Alternative, about 33 percent fewer wells are projected to be drilled, 33 percent fewer fields are projected to be developed, and about 34 percent less oil is projected to be produced than under Alternative C. It is assumed, therefore, that the incremental contribution to cumulative effects would be about 33 percent less under the final Preferred Alternative than under Alternative C.

Under Alternative B, about 16 percent fewer wells are projected to be drilled, 17 percent fewer fields are projected to be developed, and about 18 percent less oil is projected to be produced than under Alternative C, and about 25 percent more wells are projected to be drilled, 25 percent more fields are projected to be developed, and about 25 percent more oil is projected to be produced than under the final Preferred Alternative. It is assumed, therefore, that the incremental contribution to cumulative effects would be about 17 percent less under Alternative B than under Alternative C, and about 25 percent more than under the final Preferred Alternative.

Under the No Action Alternative, about 78 percent fewer wells are projected to be drilled than under Alternative C, 83 percent fewer fields are projected to be developed, and 61 percent less oil is projected to be produced. It is assumed, therefore, that the incremental contribution to cumulative effects would be about 61 to 83 percent less under the No Action Alternative than under Alternative C. Under the No Action Alternative, about 67 percent fewer wells are projected to be drilled than under the final Preferred Alternative, 75 percent fewer fields are projected to be developed, and 41 percent less oil is projected to be produced. It is assumed, therefore, that the incremental contribution to cumulative effects would be about 60 to 80 percent less under the No Action Alternative than under the final Preferred Alternative. Under the No Action Alternative, about 74 percent fewer wells are projected to be drilled than under Alternative B, 80 percent fewer fields are projected to be developed, and 53 percent less oil is projected to be produced. It is assumed, therefore, that the incremental contribution to cumulative effects would be about 53 to 70 percent less under the No Action Alternative than under Alternative B.

4.7.9 Cumulative Effects Outside of the Planning Area from the Transport of Northeast National Petroleum Reserve – Alaska Produced Oil

The BLM analyzed the impacts of operating TAPS over the next 30 years in the *Final EIS Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way* (USDOI BLM 2002a). The TAPS EIS assessed most impacts of the pipeline as small, localized, and short term. Vegetation and soils would be disturbed in very small areas along the 800-mile-long pipeline, and the risk of affecting paleontological or cultural resources was assessed as very remote. Impacts on subsistence and human health would be small, although the EIS estimated that over the course of the next 30 years there could be six fatalities and less than a hundred time-loss injuries to workers. Impacts on air, water, fish, birds, and mammals would all be small, except in the event of an unlikely large spill. Oil spills could create temporary public health risks to people in the immediate vicinity. Large oil spills could have substantial impacts on groundwater, surface water, and the marine environment. A large spill into certain water bodies could, depending on the circumstances, cause severe and possibly long-term impacts to fish. A very large spill, or one that contaminated a crucial habitat, would also be the only means by which impacts to bird or mammal populations would likely occur.

The cumulative effects of transporting Alaska North Slope oil (which would include oil produced from the Northeast National Petroleum Reserve – Alaska) by tanker from the Port of Valdez to the U.S. West Coast and Asian markets were evaluated in the *Liberty Development and Production Plan Final EIS*, which is incorporated by reference (USDOI MMS 2002a). The analysis estimated the number of cumulative tanker spills to be nine, including six spills with an average size of 3,000 bbl (four of which would occur in port and two of which would occur at sea), two spills with an average size of 13,000 bbl (both of which would occur at sea), and one spill of 200,000 bbl (at sea in the Gulf of Alaska). It was predicted that the six spills at sea and the one larger spill would not occur within the same location or contact the same resources before recovery of the affected resource. In-port spills, for which contingency measures would be in place, would be cleaned up relatively quickly. Spills originating 80 to 100 miles offshore would have a 5 to 10 percent chance of contacting the shore within 30 days. Weathering and dispersion of the oil during this time would reduce effects. When past effects have been studied, spills of 13,000 bbl or less at sea have not been found to cause serious effects to birds, fish, or marine mammal populations. A spill along the route to Asian markets would be expected to move parallel to the Alaska Peninsula and the Aleutian Island chain. Production from the Planning Area would account for approximately 13 percent of the total reasonably foreseeable future volume of oil moved to port via TAPS.

The TAPS analysis predicted few, if any, effects to threatened and endangered species from a tanker spill. For example, bowhead whales and their habitat are far removed from the tanker routes; spectacled eiders do not occur in the area that could be contacted by oil; and an oil spill would be unlikely to reach either the densely populated Steller's eider wintering area or northern sea otters and their habitat along the Alaska Peninsula or Aleutian Island chain. Potential effects to salmonids and other fish species, including the tidewater goby, Sacramento splittail, Pacific hake, white abalone and black abalone, appear limited. An oil spill in Prince William Sound or the Gulf of Alaska could have cumulative effects on sea otters in those areas and local effects on harbor seals.

Only a large, 200,000-bbl spill could cause serious effects to marine and coastal birds in the Gulf of Alaska. An oil spill in Prince William Sound could have local, cumulative effects on river otters and brown and black bears in the area. A spill could affect lower-trophic level organisms, such as plankton, algae, and seaweed that experienced contact. A 200,000-bbl spill could affect commercial fishing and result in an economic loss ranging from 37 to 64 percent per year for 2 years in the area affected by the spill. Smaller oil spills would not be expected to have measurable effects on fish species (including anadromous species) or result in measurable effects on sport fishing. If oil contact were to occur, wetlands in Prince William Sound and along west coast routes to Seattle, San Francisco Bay, and Los Angeles could experience local, cumulative effects from contact and damage caused by clean-up operations. Subsistence harvest for residents of Cordova and Yakutat, Alaska, could be reduced or altered, especially if the 200,000-bbl spill contacted and caused serious, long-term effects to sea otters, coastal birds, and harbor seals. Similarly, economic losses to the commercial fishery described above would also represent a serious loss to the subsistence fishery. A spill of that magnitude would also cause serious institutional stress and disruption to associated sociocultural systems in Cordova that could last for 4 years, with lesser effects on Yakutat. These effects would be similar to the effects experienced by these communities as a result of the *Exxon Valdez* oil spill. Archaeological resources in an area contacted by oil spills could be affected by clean-up activities, oil contamination, and vandalism, although protocols are in place to identify sites and minimize impacts from cleanup. A 200,000-bbl spill could create 10,000 cleanup-related jobs for 6 months in the first year, declining to zero by the fourth year following the spill, along with local price inflation of up to 25 percent during the first 6 months following the spill.

Effects to water-quality would vary with the location and size of the spill. Generally, the concentration of hydrocarbons in the water column would be high during the first several days following the spill, decreasing over time to background levels. While overall air quality effects from tanker transportation would be considered low, an oil spill could result in localized increases in ambient VOC concentrations caused by spill evaporation.

The potential effects of a 200,000-bbl oil tanker spill along the TAPS tanker route were analyzed in the *Gulf of Alaska/Yakutat Planning Area Oil and Gas Lease Sale 158 EIS* (USDOI MMS 1995b). The 1998 Northeast IAP/EIS used that information to analyze tanker spills occurring from production in the Planning Area (USDOI BLM and MMS 1998:Appendix B). That analysis affirms the conclusions (summarized above) of the Liberty EIS and is incorporated here by reference.

4.8 Unavoidable Adverse Effects

This section summarizes the unavoidable adverse effects that would occur under the alternatives considered in this amendment. Under the alternatives, the land allocations for oil and gas leasing range from making all BLM-administered lands in the Planning Area available for leasing (Alternative C) to making approximately 87 percent of lands available for leasing (the No Action Alternative). Unavoidable adverse effects would be expected to occur during oil and gas exploration, development, and production operations. Many of the adverse effects identified in this section would occur only if a large oil spill were to occur; however, such an event is unlikely to happen.

4.8.1 Air Quality

An increase in emissions of air pollutants would occur as a result of all alternatives. In all the alternatives and the cumulative case, the projected emissions would be less than emissions that have occurred in the past when production rates were much higher. For all alternatives, the limits to air quality standards would not be exceeded.

4.8.2 Paleontological Resources

The loss of paleontological resources has the potential to be adverse, especially if it results in the loss of scientifically important fossils. However, if surveys and inventories in areas of proposed oil and gas exploration and development activities were conducted before work began and avoidance of paleontological resource sites was possible, the incidence of impact would be greatly reduced and any impacts would be minimal. Lease stipulations and ROPs that restrict or prohibit oil and gas drilling and development in streams and rivers would reduce the likelihood of impacts to paleontological resources in the Planning Area. Additionally, strict enforcement of lease stipulations requiring non-collection of fossils also would avoid adverse impacts to paleontological resources. Included in these lease stipulations would be a mandatory training program for the workers on the importance of preserving and not collecting paleontological resources.

4.8.3 Soil Resources

While impacts to soils from exploratory drilling would occur over a small area, relative to the overall Planning Area and ACP, these impacts would be unavoidable and permanent. Development activities, such as the construction of permanent gravel pads, could cause damage or loss of soil over the area affected. Construction of any oil and gas pipelines or the use of a gravel mine site would also permanently disturb or destroy soil in the immediate vicinity of the project. If a crude or refined oil spill occurred, the resultant impact to soils could extend beyond the immediate work area. Lease stipulations and ROPs, however, would reduce the majority of effects. Once abandoned, disturbed areas would likely revegetate, and over time, lead to the development of new soil on the site as dead vegetation and mineral matter combine to make new soil.

4.8.4 Water Resources

Activities from road and pad construction could produce unavoidable adverse effects to water resources. For example, culvert and bridge work in streams and lakes could disturb stream banks or shorelines; blockages of natural channels and floodways could disrupt drainage patterns; and removal of gravel and water from riverine pools and lakes could increase erosion and sedimentation. Because roads would pose the single most critical impact to water resources because of the diversions, impoundments, and increased sediments runoff they would create, limiting the length of the roads would be the most effective way of reducing impacts to water resources.

Construction would result in short-term subsidence of the ice-rich permafrost along stream banks and lakeshores, especially in areas where waves would accelerate the removal of the protective soil and vegetative cover. Fine-grained sediments melting out of the ice-rich permafrost would increase sediment erosion and the associated changes to stream channel morphology.

Unavoidable adverse effects on water quality could occur from spills, and from construction of ice roads and gravel pads, airstrips, and roads. Lease stipulations and ROPs have been developed to minimize the risk of spills, and to provide for spill cleanup. Construction disturbances would be permitted (approved) after subsequent environmental reviews; therefore, impacts could be minimized or avoided. As noted in NRC (2003), the oil industry and regulatory agencies have made substantial progress in slowing the accumulation of effects of gravel fill by reducing the size of the footprint required for facilities and substituting ice for gravel in some roads and pads. Several lease stipulations and ROPs include requirements and standards to minimize the amount of area of surface disturbance.

Unavoidable adverse effects on estuarine water quality would occur from offshore ice-road and ice-pad construction and petroleum-related spills. The construction would have very localized, short-term effects on estuarine water quality.

The construction of coastal staging facilities would have unavoidable adverse effects on estuarine water quality. Construction disturbances would be permitted (approved) after subsequent environmental reviews; therefore

impacts could be minimized or avoided. Construction would have very localized, short-term effects on estuarine water quality, while spills could have a longer-term impact on marine waters.

4.8.5 Vegetation

All of the direct impacts to vegetation described for all alternatives would be unavoidable. Seismic activities, overland moves, and exploratory drilling would occur during the winter when the ground is frozen and snow-covered. Such activities could cause impacts that linger into the following summer, or longer, in the form of vegetation that appears greener than surrounding areas and shallow water tracks and ponding. Impacts caused by oil/gas field development, such as burial of vegetation under gravel fill and contamination by oil spills, would be unavoidable, direct adverse effects. Placement of gravel drilling pads, roads, airstrips, staging areas, and docks, as well as construction of oil and gas pipelines and the use of gravel mine sites, would permanently disturb or destroy soil and vegetation. Additionally, vegetation and soils may be disturbed by the formation of impoundments where gravel structures alter drainage patterns. Changes in plant community composition, such as those caused by snowdrift and dust accumulation, would account for about 65 percent of the area impacted by oil/gas field development. These types of impacts would have an adverse effect on the original plant community and its associated fauna, but a beneficial effect on the plant communities that colonize those areas.

4.8.6 Wetlands and Floodplains

Biological resource areas that can be classified as having the function and value of wetlands and floodplains on the North Slope include vegetation, soils, and water resources and quality. Please refer to the discussions in this section for each of these resources for information on unavoidable adverse effects on wetlands and floodplains.

4.8.7 Fish

4.8.7.1 Freshwater and Anadromous/Amphidromous Fish

Unavoidable adverse effects to freshwater and anadromous/amphidromous fish would include short-term avoidance behavior and stress related to seismic vibration activity; loss of habitat and reduced productivity created by gravel excavation in spawning, rearing, and overwintering areas; degradation and loss of habitat and mortality of fish eggs and larvae from erosion and sedimentation in streams and lakes; and lethal and/or sublethal effects to fish from oil spills. Oil-spill cleanup activities could compound unavoidable adverse impacts to fish habitat; however, the effects would be unlikely to measurably impact fish populations in the region.

4.8.7.2 Marine Fish

Unavoidable adverse effects to marine fish would occur as a result of seismic surveys, construction in or near marine waters, marine vessel traffic, and oil and fuel spills. Seismic surveys in overwintering areas could have lethal effects on some juvenile fish overwintering there. The construction of a coastal docking facility to offload supply barges adjacent to the Planning Area would affect the movement of some coastal marine and migratory marine fish. The severity of the effects of a docking facility would depend on its location, size, and design characteristics, and whether the facility required an offshore access causeway. Marine vessel traffic used to support onshore industrial activities could temporarily disturb fish. It is estimated that a very large spill (120,000 bbl) would affect 5 to 20 percent of the marine fish population in the immediate area, and would require approximately 3 to 10 years for recovery.

4.8.8 Birds

Some disturbance of birds in the Planning Area by routine activities and oil and gas development would be considered unavoidable. Disturbance related to aircraft traffic (such as aerial wildlife surveys and aircraft support of camps or oil and gas facilities), would be likely to have the greatest impact on birds. Fixed-wing aircraft and helicopters could fly over nesting areas at various altitudes, causing temporary disturbance effects such as

displacement of incubating females from nests or broods, potentially allowing predators greater access to eggs or young. Some aircraft disturbance to molting and migrating loons and waterfowl in marine habitats would be unavoidable. Aircraft flights over the Colville River Delta during the fall could impact thousands of shorebirds staging in this area prior to migration. This may be especially problematic for dunlins, the most common staging bird in the area, as they are also undergoing an energetically expensive, premigratory molt at this time. Given that there are a limited number of staging areas along the North Slope, birds may have few options for moving to new areas that provide comparable resources (Andres and Gill 2000; Flint et al. 2003). The presence of roads and pads and activities associated with oil and gas development could also cause unavoidable disturbances that affect tundra-nesting birds. The primary sources of disturbance related to roads and facilities would result from vehicular traffic, heavy equipment use, routine maintenance activities, oil spill response training activities, and pedestrian traffic. Impacts would be most important if disturbances were to occur in areas of high bird use such as the goose molting area north of Teshekpuk Lake.

It is likely that habitat would not be a limiting factor for most species nesting in the Planning Area and that many birds displaced by disturbances related to oil and gas development would move to adjacent habitats. In addition, vessel traffic along river systems or in marine habitats could cause temporary displacement of some birds from preferred habitats. Lease stipulations and ROPs would be effective in mitigating many of the effects of disturbance to tundra-nesting birds, but some impacts may be unavoidable. There would also be a permanent loss of bird habitat associated with the construction of gravel roads, pads, airstrips, staging areas, pipelines, and gravel excavation sites. The extent of disturbance or habitat loss on tundra-nesting birds would be related to the location and timing of the disturbance or habitat loss and the species and number of individuals in the immediate area. While it is likely that many birds would move to adjacent habitats, some impacts related to habitat loss could be unavoidable.

4.8.9 Mammals

4.8.9.1 Terrestrial Mammals

Some disturbance and disruption of caribou and some habitat alterations from oil development under all alternatives are unavoidable. Displacement or reduced habitat use by the TLH, WAH, and CAH caribou are likely to be local (within 2 to 2½ miles of oil field roads and pipeline corridors) and long term (greater than 1 generation), and could persist over the life of the oil fields. Some noise and disturbance of other terrestrial mammals would be unavoidable, but would be short term and localized and would not substantially affect mammal populations.

4.8.9.2 Marine Mammals

Provisions under the Marine Mammal Protection Act require lessees to obtain Letters of Authorization that direct them to avoid disturbance to polar bear dens and require the use of non-lethal means to avoid human-bear interactions. Seismic surveying, air, vessel, and ice road traffic, and construction activities would unavoidably disturb small numbers of seals and perhaps a few polar bears, but this effect would be very brief and would not affect seal and bear population abundance or overall distribution in the Planning Area. Increased barge traffic associated with development could also displace migrating whales depending upon the timing of vessel traffic. However, such impacts could be mitigated by limiting vessel traffic during migration periods. The construction of a coastal docking facility to offload supply barges adjacent to the Planning Area could affect seal habitat. The severity of the effects of such a docking facility would depend on its location, size, design characteristics, and whether the facility required an offshore access causeway. Marine vessel traffic used to support onshore industrial activities could temporarily disturb marine mammals.

4.8.10 Threatened and Endangered Species

Disturbance from noise produced by marine vessel traffic supporting oil and gas activities in the Planning Area could be unavoidable, should bowhead whales be migrating past the northern Planning Area boundary. Increased barge traffic associated with development could also displace migrating whales, depending upon the timing of

vessel traffic. However, such impacts could be mitigated by limiting vessel traffic during migration periods. Because vessel noise alone is likely to result in only minor changes in whale behavior (Richardson 1999), disturbance from such vessel activity would probably not preclude whale migration or disrupt feeding activities on a long-term basis.

Some disturbance to nesting, brood-rearing, staging, or migrating spectacled and Steller's eiders by routine activities associated with oil and gas exploration and development is considered unavoidable. The types of disturbances that could affect threatened eiders are the same as those discussed above for birds and include vehicular, vessel, and aircraft traffic, heavy equipment use, routine maintenance activities, oil spill response training activities, and pedestrian traffic. The impacts to threatened eiders from these disturbances would also be similar to those described above for birds. Because of their threatened status, it would be likely that research activities would be conducted prior to and during development of oil and gas production facilities. These research activities could involve helicopter and fixed-wing aircraft, as well as ground-based activities that could cause disturbances affecting eider nesting and brood-rearing activities. Impacts to eiders would be even greater if disturbances occurred in areas of high eider use such as the tundra ponds north of Teshekpuk Lake. Eiders could habituate to some disturbances or could move to alternate habitats for foraging, nesting, and brood-rearing. There would also be a permanent loss of eider habitat associated with the construction of gravel roads, pads, airstrips, staging areas, pipelines, and gravel excavation sites. Depending upon where development occurred within the Planning Area, such loss could affect habitat preferentially used by threatened eiders.

Lease stipulations and ROPs would effectively mitigate many of the effects of disturbance to spectacled and Steller's eiders, but some impacts could be unavoidable. The BLM expects most disturbances of endangered and threatened species associated with routine activities to be minimized or avoided through compliance with mitigation measures developed through the ESA Section 7 consultation process.

4.8.11 Cultural Resources

Cultural resources are nonrenewable, so any effects would have some importance. Because the exact locations of all potential cultural resources sites are unknown, their disturbance cannot be entirely avoided. There are cultural resources within the Planning Area that may relate to the entire span of human occupation of the region, including locales relating to the first humans to enter the Western Hemisphere. Historic and prehistoric sites may be located anywhere within the Planning Area and represent varied ages, cultures, and functions. Because soil forms slowly in the Arctic, sites that are thousands of years old may be near the surface. If surveys and inventories for cultural resources in areas proposed for oil and gas exploration and development were conducted before the work began, then the effects to cultural resources in these areas would be reduced or avoided. Timely intervention following the discovery of cultural resources would effectively mitigate many effects, either through site avoidance or data recovery. Salvage archaeology to recover remaining site data from a disturbed site would result in the total destruction of the site, although the recovered data would effectively mitigate for this destruction.

4.8.12 Subsistence

Bowhead whales, caribou, fish, seals, birds, wolves, and wolverines are important subsistence resources for NSB residents. Noise and disturbance from seismic surveys, exploration, development, and production could affect the harvest of subsistence resources in the communities of Anaktuvuk Pass, Atqasuk, Barrow, and Nuiqsut. Additionally, disturbance could cause potential short-term impacts to long-tailed ducks and some eider populations. No harvest areas would become unavailable for use, but many subsistence users would avoid areas of oil development because of regulatory exclusion (real or perceived), and potential for contamination of species.

While noise, traffic disturbance, and oil spills would produce chronic, short-term impacts on subsistence species, none of these impacts would lead to the elimination of any subsistence resource. Disturbance to, and displacement of, caribou could lead to an unavoidable reduction in the total annual caribou harvest by making the harvest more difficult, costly, and time consuming for subsistence hunters. Wolf and wolverine harvests would be reduced in areas of human activity, while bear and fox could habituate to oil and gas activities within the Planning Area.

Effects on the harvest of other species from noise and traffic disturbance, and construction activities should be avoidable, if mitigated. If oil and gas infrastructure were located in subsistence hunting areas, some (real or perceived) restrictions on access by subsistence hunters would be unavoidable.

4.8.13 Sociocultural Systems

The inability to harvest sufficient quantities of bowhead whales as a result of disturbance could cause unavoidable effects on Iñupiat traditional harvesting and sharing practices. These effects would increase if the harvest shortage lasted more than one whaling season. Disturbance effects on caribou could disrupt sociocultural systems for an entire season or more; nevertheless, it is not expected that these disruptions would displace ongoing sociocultural institutions, community activities, or traditional practices for harvesting, sharing, and processing resources. Some cultural values, such as sharing, could be reinforced by shortages in the short term, but could be strained after several seasons of harvest shortages. Long-term harvest failures or the loss of a resource would irreparably strain the bonds of sharing and reciprocity that bind the community of Nuiqsut. The loss of the resources that Iñupiat people use to define themselves would further distance younger generations from their Iñupiat heritage and could cause profound changes in the community. Federal, NSB, and community-supported social programs with adequate funding would mitigate many of the sociocultural consequences of oil and gas development in the Planning Area. However, unavoidable repercussions to the communal practice of sharing of subsistence resources could occur.

4.8.14 Environmental Justice

The Environmental Justice Executive Order requires the consideration of the potential effects of proposed projects on Native subsistence activities. Noise and disturbance from routine development activities would be unavoidable. The most substantial unavoidable environmental justice effects on Native communities would be from exploration and development activities that reduced the populations or production of terrestrial mammals, water birds, and fish. These effects, which would be most prevalent under Alternative C, would primarily affect subsistence resources and would thus fall disproportionately on Native minority populations. Most other subsistence effects would be short term, local, and relatively minor, and would not be expected to raise environmental justice issues.

4.8.15 Coastal Zone Management

Activities occurring under the four alternatives are not expected to result in unavoidable adverse effects in the form of major changes in land use or conflicts with the ACMP, including the NSB Coastal Management Program. All four alternatives would likely result in short-term, unavoidable effects on subsistence activities from the change in land use in portions of the Planning Area from subsistence-based open space to industrial. To the extent that facilities would be sited and designed to minimize disturbance and the effects of an oil spill on the environment, conflicts with the statewide standards and the NSB policies are avoidable. It is expected that activities generally would conform to existing policies of local, state, and federal land use plans and coastal management programs.

4.8.16 Recreation Resources

Adverse effects to scenic quality, solitude, naturalness, and primitive/unconfined recreation from oil and gas exploration and development are unavoidable. These effects would be a direct result of exploration and development activities and facilities such as drill pads and pipelines. The areal extent of the effects would be limited to the viewshed and/or noiseshed of the development activities, leaving most of the Planning Area unaffected, but the impacted areas would lose their potential Wilderness characteristics for at least the life of the activity. Recent and future technological advances could make green trails and pads an avoidable impact.

Potential outstandingly remarkable values of the Wild and Scenic River eligible Colville River could be degraded by oil and gas exploration, development, and production activities, but the unavoidable adverse effects would be limited to the area(s) in close proximity to a pipeline or road crossing of the river. The effects would not alter the current status of unsuitability, but could limit the likelihood of a future change in that status.

4.8.17 Visual Resources

Unavoidable adverse effects to visual resources (i.e., the viewsheds and naturalness of the landscape) would occur from oil and gas exploration and development through the introduction of vertical lines, regular spacing, and a greater spectrum of colors. These effects would be a direct result of oil and gas exploration and development activities and facilities such as drill pads, roads, and pipelines. Recent and future technological advances could make green trails and pads an avoidable impact.

4.8.18 Economy

Most economic effects of oil and gas leasing, exploration, development, and production in the Planning Area would be considered positive effects by many people. Increases in employment and associated personal income would occur over the life of the exploration, development, and production activities. Revenue increases to the NSB, and to the state and federal governments, would occur during production years. However, these increases would be short term (less than 30 years), occurring only for the duration of the activities. Development activity would establish infrastructure that could enhance the future productivity of oil and gas exploration, development, and production.

4.9 Relationship Between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

This section discusses the short-term effects of the potential use of portions of the Planning Area for oil and gas exploration and development activities, versus the maintenance and enhancement of potential long-term productivity of the Planning Area's environmental resources.

Short term refers to the total duration of oil and gas exploration and production activities, whereas long term refers to an indefinite period beyond the termination of oil and gas production. The specific impacts vary in kind, intensity, and duration according to the activities occurring at any given time. Initial activities, such as seismic surveying and exploration drilling, result in short-term, localized impacts. Development drilling occurs sporadically throughout the life of an oil or gas field, but also results in short-term, localized impacts. Activities during the production life of a field may result in chronic impacts over a longer period of time (25 to 35 years), potentially punctuated by more severe impacts as a result of accidental events. Platform removal is also a short-term activity with localized impacts; the impacts of site clearance may be longer lasting. Over the long term—several decades—natural environmental balances are expected to be restored.

Until more reliable data become available, the long-term effects of chronic or major spills of hydrocarbons cannot accurately be projected. In the absence of these data, it must be assumed that chronic spills or a major large oil spill could result in decreased long-term productivity.

4.9.1 Air Quality

The risk to air quality from development, production, and transportation from each of the alternatives would be similar to the risk from present and historic oil and gas development, production, and transportation. Short-term degradation of air quality related to construction, placement, and operation of exploration and production facilities would be the same as those for other oil and gas exploration and production facilities. Air quality is a renewable resource; and, when activities that produce emissions cease, the local air quality returns to its original natural condition.

4.9.2 Paleontological Resources

Because paleontological resources are nonrenewable, there is no difference between short-term and long-term impacts. The resource cannot recover from some types of adverse impacts. Once disturbed, the materials and

information of paleontological deposits may be permanently compromised. Any destruction of paleontological sites, especially ones determined to have particular scientific value, would represent long-term losses. Any discoveries of paleontological resources as a result of surveys required prior to development of a lease would enhance long-term knowledge of the area and these resources. Furthermore, once paleontological deposits are disturbed and exposed, then natural erosion could accelerate the destruction of fossils. Exposed fossils also are vulnerable to unauthorized collecting and digging.

4.9.3 Soil Resources

Soils potentially affected by exploration practices cover very small areas, although up to 2,000 acres of soil would be directly impacted during development for construction of pads and roads. Additional soil could be lost if new gravel quarries are developed. Replacement of soils after well abandonment could allow soils to eventually re-establish. While the formation of soils is a very slow process, short-term uses are projected have very small long-term effect. Soils lost through the construction of permanent facilities would essentially be permanent.

4.9.4 Water Resources

Oil and gas exploration and development would result in both short-term and long-term effects to water resources. Construction activities that disturb stream banks or lake shorelines, temporarily block natural channels, and remove gravel would all cause short-term increases in erosion and sedimentation. Water removal could cause short-term changes in aquatic habitat. Permanent gravel roads and pads, airstrips, pipelines, and facilities constructed adjacent to or crossing streams and lakes would have long-term effects on water resources. Removal of these structures from streams and lakes after production ceased would restore drainage patterns and natural sedimentation processes. Long-term changes could occur where thermokarst erosion caused major changes in stream banks, and lake shorelines, and altered natural drainage patterns. Oil spills would have both short- and long-term impacts, especially to fish resources of Teshekpuk Lake and other fish-bearing lakes and streams.

Oil and gas exploration and development would result in both short-term and long-term effects to water quality. Construction activities associated with road and pad construction; culvert and bridge work in streams and lakes that disturbed stream banks or shorelines; blockages of natural channels and floodways that disrupted drainage patterns; and removal of gravel would all cause short-term increases in erosion and sedimentation. Water removal could cause short-term changes in aquatic habitat, although these impacts would be minimized by limiting water withdrawals to 15 percent of less of the total volume of the water body. Permanent gravel roads and pads, airstrips, pipelines, and facilities constructed adjacent to or crossing streams and lakes would have long-term effects on water quality. Oil spills would have both short- and long-term impacts on water quality, especially to fish resources of Teshekpuk Lake and other fish-bearing lakes and streams. The magnitude and duration of effects would vary with the type and extent of the activities.

Degradation of water quality from construction and operation of oil field(s), winter ice roads, and spills could have a long-term effect on isolated water bodies.

4.9.5 Vegetation

The effects of non-oil and gas activities on vegetation would be short term. However, the construction of well collars for exploration wells and the most severe impacts caused by vehicles during overland moves and seismic exploration would cause long-term affects on vegetation. All effects of oil-field construction on vegetation would be long term, though new oil spills and dust and gravel spray from vehicular traffic on the gravel pads would not occur after field abandonment. The recovery time for vegetation from a spill could last several years (Jorgenson 1997, McKendrick 2000), but it is not known how long changes to plant communities as a result of dust effects would persist. Although research indicates that natural plant communities can be restored to gravel pads (McKendrick 1997), especially if some silt-loam soil is added to the substrate, the time until recovery of natural canopy cover would be so long that the impacts might be considered permanent from a human perspective. Therefore, the long-term productivity of these localized areas would be reduced; however, these areas represent

between 0.1 and 1 percent of the Planning Area. Placement of gravel drilling pads, roads, airstrips, staging areas, and docks, as well as construction of pipelines or the use of gravel mine sites, would permanently disturb or destroy vegetation unless sites were reclaimed.

4.9.6 Wetlands and Floodplains

Biological resource areas that can be classified as having the function and value of wetlands and floodplains on the North Slope include vegetation, soils, and water resources. Please refer to the discussions for each of these resources for information on the relationship between local short-term uses and maintenance and enhancement of long-term productivity of wetlands and floodplains.

4.9.7 Fish

4.9.7.1 Freshwater and Anadromous/Amphidromous Fish

Impacts to fish resources and habitat would occur from oil and gas exploration and development. Most impacts would be short term and confined to small segments of habitat and localized components of the fish population. Although seismic surveys, construction activities, and oil spills are of particular concern, disturbances would be unlikely to result in decreased long-term productivity of fish populations. The exception would involve an oil spill in a waterbody with no migration pathways. Losses in a specific waterbody would be permanent if all individuals of a species were killed in a spill.

4.9.7.2 Marine Fish

Some marine fish could be lethally or sublethally affected by oil and gas activities in the Planning Area, but the number would likely be too small to be measurable at the population level. These effects are likely to be relatively short term, and with recovery expected within 3 years. A hypothetical very large spill (120,000-bbl) would affect an estimated 5 to 20 percent of the marine fish in the area. Full recovery from a spill of this size would be expected in 3 to 10 years, depending on the amount of oil reaching the nearshore area, and the amount of shoreline oiled.

4.9.8 Birds

Birds may experience short-term effects from any factors or activities that disturb their normal daily and seasonal pattern of activities. Of the routine activities associated with oil and gas exploration and development, helicopter, fixed-wing, and occasional marine support vessel traffic would have the greatest potential for disturbing birds. Helicopter flights would likely occur throughout the life of this project. Although much of the potential effect of air traffic could be avoided through compliance with lease stipulations and ROPs, aircraft could be required to fly at lower altitudes and cross critical parts of the coast during inclement weather. Under these conditions, disturbance of birds along the flight path could occur. Brant may be more affected by aircraft traffic, particularly helicopters, than other species (Derksen et al. 1992). Disturbances that affect survival rates of brant or other species of concern could have long-term effects on populations. The other sources of disturbance related to roads and facilities would result from vehicular traffic, heavy equipment use, routine maintenance activities, oil spill response training activities, and pedestrian traffic. These disturbances would likely impact birds during the life of the field, but would unlikely continue after field abandonment; the effects of habitat loss or alteration may continue indefinitely.

4.9.9 Mammals

4.9.9.1 Terrestrial Mammals

Most effects on terrestrial mammals and their habitats from non-oil and gas activities and from oil and gas exploration would be short term. Short-term, localized effects could occur in the event of an oil spill, although it is expected that oil spills in the Planning Area would be small and would not likely affect a large area. Potential effects include mortality of individuals, physiological stresses in surviving individuals, reduction in the number of

species or species populations in the affected area, changes in the distribution of species or individuals, and changes in behavior or migration patterns. Long-term, cumulative effects could occur if recovery from the short-term effects extended beyond the production life of the field. The potential effects of noise disturbance and terrestrial habitat alteration could also include short-term, localized effects such as mortality, stress, decreases in or redistribution of populations or species, and changes in survival patterns. Effects of oil and gas development on terrestrial mammals and their habitats would be long term (beyond the production life of the field); however those effects are not expected to be have impacts at the population level. Long-term biological productivity could be lost from areas used as facility sites.

4.9.9.2 Marine Mammals

Noise, disturbance, and habitat alteration from offshore construction activities and oil spills would temporarily affect some individual marine mammals and their habitats. These effects should be localized. Disturbances and altered habitat could result in local displacement, mortality, or stress in some species, or decreases or reductions in the local abundance of some species. Effects could possibly last over the long term if recovery from the short-term effects was extended beyond the field's estimated useful life.

4.9.10 Threatened and Endangered Species

Bowhead whales could be disturbed by noise from oil- and gas-related marine vessel traffic during years when the bowhead whale fall migratory path lies closer to shore than the mean migration distance (20 miles from 1982-2001; Treacy 2002a, b). Displacement would be temporary and short term, and could potentially occur annually over the life of the field. Aircraft traffic associated with development during the fall migration period potentially could disturb bowhead whales migrating very near shore. Since most of these activities are temporary, effects would be short term and potentially occur annually over the life of a field. In the unlikely event of a large oil spill, there could be long-term effects to the bowhead whale population from residual oil and continuing clean-up activities.

Spectacled and Steller's eiders could experience short-term effects from any factors that disturb their normal daily and seasonal pattern of activities and could continue for the life of the field. These effects would result from disturbances related to aircraft and vessel traffic. In addition, sources of disturbance related to roads and facilities would result from vehicular traffic, heavy equipment use, routine maintenance activities, oil spill response training activities, and pedestrian traffic. These disturbances would likely impact birds during the life of the field, but would be unlikely to continue after field abandonment. Aircraft and ground-based research activities could impact threatened eiders for the life of the field. Many of these activities would likely discontinue after field abandonment, although some aerial surveys, to conduct long-term monitoring, would most likely continue after abandonment.

The effects of eider habitat loss or modification adjacent to roads and pads would likely be short term, although loss of habitat due to gravel placement would have a long-term effect that would likely last beyond field abandonment, unless habitat restoration was planned and implemented. Although nesting or brood-rearing habitat loss in the footprint of gravel infrastructure would have a long-term effect, other suitable habitat is widespread, and the effect on threatened eider populations would probably be minimal.

Potential eider mortality could result from collisions with vehicles or structures and would continue for the life of the field. Long-term effects could result if structures were not removed during field abandonment. However, eider mortality due to collisions with vehicles or structures has not been a major source of mortality in North Slope oil fields and would be unlikely to affect threatened eiders at the population level.

4.9.11 Cultural Resources

Because cultural resources are nonrenewable, there is no difference between short-term and long-term impacts. Cultural resources cannot recover from most types of effects. Historic structures could benefit from preservation and stabilization efforts prompted by nearby development. However, once disturbed, an archaeological deposit

could never be returned to its original context. Any destruction of cultural resource sites would represent long-term losses. Salvage archaeology to recover remaining site data would generally result in the total destruction of the site, although the recovered data would effectively mitigate for loss of the site. Any discoveries of cultural resources made during surveys required prior to development of a lease would enhance knowledge of the history and early inhabitants of the region and serve to effectively mitigate further potential effects of activities in the area.

4.9.12 Subsistence

In the short term, the redistribution, reduction, or displacement of subsistence species could affect regional subsistence-harvest patterns. Such short-term effects would not be expected to have long-term consequences unless chronically imposed on the subsistence resource base of the region. Habitat destruction could cause a local reduction in subsistence species, a potential long-term impact to communities affected by such reductions. Increases in the amount of land used for infrastructure and development would reduce the amount of area suitable for subsistence hunting. Development along the coast could change the distribution of caribou in the summer, when the greatest numbers are harvested as the herds seek insect relief on beaches and in shallow lake and marine waters. Roads would increase access and competition for resources over the long term and could further affect subsistence harvests. Increasing human populations would require that more resources be harvested over wider areas to maintain the subsistence way of life. The potential for user conflicts could increase in areas where current uses overlap.

4.9.13 Sociocultural Systems

Increased population, industrial activity, and minor gains in revenues and employment could potentially disrupt sociocultural patterns in Native communities in the short term. Income and employment allocation disparities could increase, causing intra-community conflict. Short-term effects on subsistence resources would disrupt social systems if these effects were to occur repeatedly (chronic) over the lifetime of oil and gas activities in the Planning Area and on the North Slope. Habitat destruction would locally reduce or displace subsistence species, a long-term cumulative effect on the regional subsistence economy. As a result, sociocultural values and cultural institutions would be affected. Activities or policies that act against the values of the Iñupiat residents of the region would increase social stress and concerns in the community.

4.9.14 Environmental Justice

Any impact on subsistence resources that would have a chronic effect on the sociocultural system or subsistence resources over the lifetime of oil and gas activities (about 30 years) would disproportionately affect the Iñupiat people. Such an effect would only be expected to occur in the event of long-term population and productivity effects to caribou, fish, or water birds.

4.9.15 Coastal Zone Management

Land use could change along pipeline routes. If land use in parts of the Planning Area were to shift from subsistence-based activities to industrial activities, and if, after production ceased, use of the land reverted to subsistence, the effect would be short term. Long-term effects on land use could result if use of the infrastructure or facilities were to continue after the production life ended. Potential users could be other resource developers. Residents and nonresidents could become accustomed to the convenience of using existing facilities, such as roads.

4.9.16 Recreation Resources

Short-term use of portions of the Planning Area for oil and gas development could affect the long-term use and value of recreation and wilderness resources. Rehabilitation and removal of pads, roads, and facilities would be unable to restore the original condition of the land or its original recreation and wilderness value. If airstrips were not removed or rehabilitated, recreation opportunities in the area could be enhanced by increasing access.

However, scenic quality, naturalness, and primitive and unconfined recreation opportunities, which are essential to wilderness values, still would be negatively impacted by the presence of the airstrip.

River values that would be protected by designating the Colville River (the only eligible river) as a component of the national Wild and Scenic River system are free-flow, unpolluted waters, wildlife viewing, geology, archeology, and paleontology. The relationships between short-term uses and long-term productivity on these river values are more specifically addressed in the relevant sections addressing these values.

Oil and gas exploration, development, and production activities would constitute a short-term commitment of resources that could impact river values. For example, archeological and paleontological resources, which are nonrenewable, might be affected in the long term. The short-term commitment of resources would not affect the finding of nonsuitability on the Colville River, which is based on a combination of local political opposition and lack of federal control of the right bank of the river.

4.9.17 Visual Resources

Short-term use of portions of the Planning Area for oil and gas development could affect the long-term value of visual resources. Rehabilitation, removal, and revegetation of pads, roads, and facilities would eventually cause the viewshed to resemble a more natural condition. However, it is possible that the full value of the original scenic quality and viewshed would not be regained. Visual resources could still be negatively impacted by any remnants of oil and gas activities and by changes from the original landscape.

4.9.18 Economy

Economic benefits would accrue from production of oil and gas from federal lands. Economic benefits, including any decrease in the Nation's dependency on foreign oil, would be short term. Increases in employment and associated personal income would occur over the life of the exploration, development, and operations activities. Revenue increases to the NSB and to the state and federal governments would occur during the production years. However, these increases would occur only for the duration of the activities. Development activity would result in infrastructure that in the short term could enhance future productivity of oil and gas exploration, development, and production.

4.10 Irreversible and Irretrievable Commitment of Resources

Irreversible or irretrievable commitments of resources refers to impacts or losses to resources that cannot be reversed or recovered. Examples are the extinction of a species or the permanent conversion of a vegetated wetland to open water. In either case, the loss is permanent. The following section identifies irreversible and irretrievable commitments of resources that would occur if leasing occurred and resulted in oil and gas exploration, development, and production.

4.10.1 Air Quality

Air quality would be affected by well drilling, construction activities, and production. These effects would occur only during the life of the field(s). There would be no irreversible or irretrievable effects on air quality.

4.10.2 Paleontological Resources

Because paleontological resources are nonrenewable, any impacts would render the resource disturbance irreversible and the integrity of the resource irretrievable.

4.10.3 Soil Resources

Soils covered by gravel pads, roads, landing strips, and other infrastructure facilities would be lost with respect to their value (such as a medium for the growth of vegetation) as soils. Removal of structures, like gravel pads, could retrieve some soils, but would be unlikely. Soil in disturbed areas could re-establish over time, but soil development in cold climates is a very slow process. The desirable mitigation for soils would be to minimize the total area lost, through careful use of the surface, creative design practices, and use of shared facilities. Several of the lease stipulations and ROPs are designed to reduce the amount of soil impacted by exploration and development activities.

4.10.4 Water Resources

Thermokarst erosion along gravel roads and pads could result in major changes to streambanks and lake shorelines, and altered natural drainage patterns that would last long after the life of the field(s). While there would be no irreversible or irretrievable effect on water resources, the restoration of the natural drainage could take years after the field(s) were abandoned, equipment removed, and the roads and pads rehabilitated.

Thermokarst erosion along gravel roads and pads could result in degraded water quality that would last long after the life of the field(s), but the effects would not be irreversible. Oil spills could have an irretrievable effect on water quality if the spill could not be cleaned up and the oil sank to the bottom of the lake or contaminated the shoreline to the level that cleanup was not practical.

4.10.5 Vegetation

Permafrost-related geomorphic processes occurring on the ACP create a constantly changing landscape that influences successional patterns in plant communities. Most plant communities of Alaska's North Slope are well adapted to these frequent changes (Billings and Peterson 1980; Bliss 2000; Funk et al. 2004). Therefore, changes in plant communities resulting from dust or snowdrift accumulations or the formation and draining of impoundments would not be considered irreversible. However, the burial of vegetation under gravel fill could be considered an irretrievable commitment of vegetation resources, as the potential recovery of vegetation on these pads could take 25 to 30 years or more (McKendrick 1997, 2000).

4.10.6 Wetland and Floodplains

Biological resource areas that can be classified as having the function and value of wetlands and floodplains on the ANS include vegetation, soils, and water resources. Please refer to the discussions for each of these resources for information on irreversible and irretrievable commitment of resources in relation to wetlands and floodplains.

4.10.7 Fish

4.10.7.1 Freshwater and Anadromous/Amphidromous Fish

Arctic fish in and near the Planning Area would be exposed to overland seismic surveys, construction-related activities, and spills associated with oil and gas exploration and development. A relatively small number of fish would likely be affected by these activities. Fish populations should not experience any irreversible and irretrievable effects associated with activities undertaken as a result of this amendment.

4.10.7.2 Marine Fish

While some marine fish could be lethally or sublethally affected by management actions in the Planning Area and would require up to 3 years for a full recovery, it is unlikely that these effects would be biologically measurable at the population level. The exception would be a hypothetical 120,000-bbl oil spill. Depending on the amount of oil

deposited in the nearshore area during summer, and the amount of actual shoreline oiled, it is estimated that a 120,000-bbl spill could affect 5 to 20 percent of the marine fish population in the sale area (estimated 3 to 10 year recovery). Because full recovery would be expected following any oil spill, no irreversible and irretrievable commitment of resources should occur.

4.10.8 Birds

Some irretrievable and irreversible loss of habitat could occur from the placement of gravel for infrastructure in bird nesting or brood-rearing habitats. Loss of wetland habitat occupied by waterfowl and shorebirds could be particularly important. In most scenarios, alternate habitats would likely be available adjacent to developments, and any habitat loss would have a minor effect. Loss of individual birds through collision with facilities or structures could occur; however, such losses are not expected to have an effect on regional populations.

4.10.9 Mammals

4.10.9.1 Terrestrial Mammals

It is possible that caribou and other terrestrial mammals could be subjected to the direct and indirect effects of noise and movement of motor vehicles and aircraft, other human activities, oil spills, natural gas blowouts, or losses and deterioration of habitat because of facility developments. It is likely that such effects would lead to some permanent (irreversible) losses of these resources.

4.10.9.2 Marine Mammals

Seals, walruses, polar bears, and beluga whales could be subjected to direct and indirect effects of oil spills, disturbance caused by noise and movement of aircraft and vessels, and other human activities. It is unlikely that such effects would lead to permanent (irreversible) losses of these resources.

4.10.10 Threatened and Endangered Species

For threatened and endangered species, any irretrievable or irreversible commitment of resources important to the long-term survival and recovery of the species would probably violate the intent of the Endangered Species Act. Since the bowhead whale population is increasing and effects from noise would likely be temporary, irreversible or irretrievable losses would be unlikely. Any deterioration of the bowhead whale auditory environment resulting from noise-producing activities in coastal areas would last only as long as the causative activity.

Some irretrievable and irreversible loss of habitat could occur from placement of gravel infrastructure for oil and gas facilities in spectacled or Steller's eider nesting or brood-rearing habitat. This loss of habitat could be permanent unless habitat restoration was planned and implemented during field abandonment. Impoundment formation adjacent to roads and pads could also create habitat for threatened eiders. Because alternate habitat would likely be available in areas adjacent to proposed development, any habitat loss would likely have a minor effect on threatened eiders.

Eider mortality could result from collisions with vehicles or structures during the life of the field. Any losses of individual eiders through collision with facilities or structure would be irretrievable, but would not be expected to affect eiders at the population level. If structures were not removed, long-term effects to eiders could result after field abandonment.

4.10.11 Cultural Resources

Cultural resources are nonrenewable, so any impacts would be irreversible, and the integrity of the affected resource would be irretrievable. Since most known cultural resources exist in a surface or near-surface context, burial by the construction of a gravel pad or road, while possibly not damaging in itself, would affect the cultural

resource upon removal of the gravel. If subsurface cultural resources were encountered, as during the development of a gravel mine site, such resources could be damaged or destroyed. The loss of such cultural resource information would be irreversible and irretrievable. Salvage archaeology to recover remaining site data would generally result in the total destruction of the site, although the recovered data would effectively mitigate for loss of the site. Any discovery of cultural resource data as a result of surveys required prior to development of a lease would enhance long-term knowledge. Overall, such finds could help fill gaps in our knowledge of the history and early inhabitants of the area.

4.10.12 Subsistence

Many important aspects of Iñupiat society and culture are centered on subsistence activities (see Appendix J). Virtually every family in North Slope coastal communities participates in the hunting of the bowhead whale and the sharing of its meat and *maktak*. The activities associated with harvest of caribou, fish, birds, wolf, wolverine, and seals are only slightly less important to the cultural integration of the region as a whole, but they are of equal importance to the inter- and intra-community social organization, cultural identity, and the domestic economies of most households. The reduction or loss of the ability to harvest sufficient quantities of these resources would be an irreversible and irretrievable loss to the Iñupiat diet, to Iñupiat traditional practices of sharing and reciprocity, and to fundamental aspects of Iñupiat identity. If subsistence users were to abandon traditionally used harvest areas because of legal or perceived regulatory boundaries or contamination concerns at or near an oil or gas development, this abandonment would contribute to a loss of access, affecting the connection of Iñupiat subsistence users to traditional use areas.

4.10.13 Sociocultural Systems

Disruption of the traditional harvest of bowhead whales and caribou could constitute an irreversible and irretrievable loss to Iñupiat social and cultural values. The alienation of Iñupiat subsistence users from their homelands would be an irreversible and irretrievable commitment of resources, as land use patterns have shown that when oil and gas development activities take place in an area, other land uses are curtailed and land users excluded (Brown 1979; Pedersen et al. 2000). This connection to the land is one factor that constitutes Iñupiat identity, not least in terms of how one identifies oneself in Iñupiat society by area of residence, such as *Kuukpikmiut*, a person of the Colville River area. The contribution of oil and gas development in the Planning Area to the cumulative consequences of offshore and onshore energy development could, in conjunction with other processes of social change in the long term, lead to social and cultural conflicts within and between communities and contribute to the compromise of Iñupiat value systems. If the Iñupiat were to lose access to traditional use areas and culturally-valued sites in the Planning Area, or avoid them for cultural reasons, then sociocultural patterns could be affected; there would be a loss of continuity between generations and changes in sharing and reciprocity within and between communities as a result of a reduction in subsistence harvests.

4.10.14 Environmental Justice

Long-term population and productivity effects to caribou herds, fish populations, or waterfowl from oil and gas development could produce irreversible and irretrievable effects to subsistence resources. These effects would translate into effects on Native minority populations and thus raise environmental justice issues.

4.10.15 Coastal Zone Management

There are no anticipated conflicts with the statewide standards of the Alaska Coastal Management Program or the enforceable policies of the NSB Coastal Management Program. Development activity would result in the construction of infrastructure, but the majority of the infrastructure would be inside the boundaries of the Planning Area. Some infrastructure, such as pipelines, could be located outside the Planning Area, within the boundaries of the NSB, but such infrastructure could be removed after development ended.

4.10.16 Recreation Resources

There would be no irreversible and irretrievable commitment of recreation resources. Proper rehabilitation and removal of development pads and other structures would restore the perception of a natural environment. Wilderness values would be forgone in those areas affected by development for the duration of the development, rehabilitation, and recovery. Future eligibility for Wilderness designation would depend on the level of success of rehabilitation and recovery efforts after completion of petroleum production.

Irreversible and irretrievable impacts on Wild and Scenic River values on the Colville River are possible as a result of oil and gas exploration, development, and production activities, but the effects would likely be limited to a relatively small area near a pipeline or road crossing. The potential effects would not alter the finding of nonsuitability for the Colville River.

4.10.17 Visual Resources

There would be no irreversible or irretrievable commitment of visual resources. Proper removal, rehabilitation, and revegetation of development pads and other facilities would restore the perception of a natural environment. To the casual observer, viewsheds would appear natural.

4.10.18 Economy

Increases in employment and personal income would occur over the life of the exploration, development, and operation activities. Investment by the lessees and operators in oil and gas exploration and development activities in the Planning Area would represent a loss of opportunity to invest those monies elsewhere. Revenue increases to the NSB and the state and federal governments that would occur during production years would result in the irreversible and irretrievable commitment of those revenues. Development would result in new infrastructure that would be removed at the end of production.

4.10.19 Oil and Gas Resources

Oil and gas resources are expected to be leased, discovered, developed, and produced as a result of leasing in the Planning Area. The oil and gas resource estimates for each alternative considered in this amendment are presented in Table 4-5. For the highest case scenario (Alternative C and $30 per bbl of oil), it is estimated that approximately 2,488 MMbbl oil would be available for production. Should these resources be produced, they would be irretrievably consumed. In the unlikely event of a large oil spill, the oil spilled would be irretrievably lost.

4.11 Low-Probability, Very Large Oil Spill

4.11.1 Introduction

This section discusses the probabilities and potential effects of a very large oil spill in the Planning Area. In this Amended IAP/EIS, a very large spill is defined as greater than or equal to 120,000 bbl of oil. A very large oil spill is a low-probability event with the potential for severe effects. A similar analyses of a very large tanker or pipeline spill was included in Appendix B of the 1998 Northeast IAP/EIS (USDOI BLM and MMS 1998) and is incorporated here by reference. Various scenarios for large pipeline spills were analyzed in the Final EIS for the TAPS pipeline (USDOI BLM 2002a). Because very large spills happen so infrequently, there is limited historical data for use in statistical analysis and prediction.

The ADEC North Slope spill database for 1995 to 2003 (ADEC 2003) indicates that five very large volume spills have been reported for the North Slope oil fields since 1977, none of which were of oil or produced fluids. During that time the total oil production was approximately 1.6×10^{12} gallons (ADR 2004a). Thus, the probability of a

very large volume oil spill occurring in the Plan Area approaches zero. This probability is extremely low for all hazardous materials combined.

The largest hypothetical spills would be of produced fluids from a well blowout. However, the largest spills in the ADEC 1995 to 2003 database are of seawater and produced water. The following very large volume spill impact assessment is based primarily on potential spills of produced fluids from a blowout.

4.11.1.1 Well Control Incidents

The record of Alaska North Slope well control incidents or blowouts is not validated, but is presented as the best available information. Although the State of Alaska does not maintain a database of North Slope well-control incidents, the Alaska Oil and Gas Conservation Commission maintains an internal documentation of blowouts in Alaska. Neither of the authors cited below (Mallory 1998; Fairweather E&P Services, Inc. 2000) was allowed to review the documentation. The Alaska Oil and Gas Conservation Commission assured Fairweather E&P Services, Inc., that no blowouts had been overlooked.

Two written reports regarding blowouts on the Alaska North Slope are available—Mallory (1998) and Fairweather E&P Services, Inc. (2000). Mallory (1998) presents the following data based on discussions with long-time Alaska drilling personnel with ARCO Alaska or BP Exploration Alaska (BPXA). In the period 1974 through 1997, an estimated 3,336 wells were drilled on Alaska's North Slope. Research conducted to date has documented six cases where secondary well control was lost with a drilling rig on the well. The documentation does not differentiate between exploration and development wells. No oil spills, fires, or loss of life occurred in any of the events (Mallory 1998).

Fairweather E&P Services, Inc. (2000) differentiated between a blowout and a well-control incident. A blowout was defined as an uncontrolled flow at the surface of liquids and/or gas from the wellbore that resulted from human error and/or equipment failure. Fairweather E&P Services, Inc. (2000) found 10 blowouts: the 6 blowouts that Mallory had identified and 4 blowouts that occurred before 1974. Of the 10 blowouts, 9 were gas and 1 was oil. The blowout of oil in 1950 was unspectacular and could not have been avoided, since there were no casings or blowout preventers available (Fairweather E&P Services, Inc. 2000). These particular drilling practices from 1950 would not be relevant today.

A third study confirmed that no crude-oil spills greater than or equal to 100 barrels occurred from blowouts between 1985 and 1999 (Hart Crowser, Inc. 2000). The record of oil spills less than 100 bbl from blowouts was not searched by Hart Crowser, Inc. (2000).

Two spills of volumes greater than 50,000 bbl from blowouts have occurred in federal waters since offshore drilling began in the U.S. The largest spill from a blowout in federal waters was 80,000 bbl from the blowout in Santa Barbara Channel in 1969; the other was in the Gulf of Mexico in 1970. Because there have been no spills greater than or equal to 120,000 bbl in U.S. waters from blowouts, worldwide historical spill data must be incorporated to estimate the chance of a very large spill occurring. The information used here is based on spills from countries that do not have the regulatory standards that are enforced on the OCS or BLM-administered lands. In addition, some drilling practices used elsewhere either are not practiced here or are against MMS and BLM-administered regulations.

From 1979 through 2000, five oil-well blowouts greater than or equal to 10 million gallons (238,000 barrels) have occurred worldwide (Oil Spill Intelligence Report 1996; Cutter Information Corp. 1997; DeCola 2001). The causes of the blowouts were either war or drilling practices that oil companies do not now use and are not allowed to use under MMS regulations in the U.S. During this same time period, there were roughly 471 billion barrels of oil produced worldwide (British Petroleum 2001). These data indicate that the rate of occurrence of blowouts greater than or equal to 10 million gallons is 0.01 blowouts per billion barrels produced. If this rate is applied to Alternative C for Planning Area, the estimated probability of one or more oil spills of 10 million gallons (238,000 barrels) is 0.026 over the lifetime of the project.

S.L. Ross Environmental Research Ltd. (1998) calculated the chance of an extremely large oil spill (greater than 150,000 bbl) from a blowout with an average number of wells from the Northstar and Liberty projects using worldwide spill frequencies would be similar to those presented in the preceding paragraph.

Scandpower AS (2001) completed a blowout-frequency assessment for the Northstar development project. This analysis modified statistical blowout frequencies to reflect specific conditions and operating systems for drilling at Northstar. The estimated blowout frequency for drilling into the oil-bearing zone and spilling greater than 130,000 bbl is 9.4×10^{-7}.

At North Star, the State of Alaska prohibits the drilling of new wells or sidetracks from existing wells into major liquid-hydrocarbon zones at drill sites under their regulation during the defined period of broken ice and open water. This period begins on June 13 of each year and ends when 18 inches of continuous ice cover are present for a half mile in all directions from the Northstar Island. This seasonal drilling restriction eliminates the environmental effects associated with a well blowout during drilling operations in broken ice or open-water conditions.

Although the drilling prohibition reduces the chance of a blowout during periods of broken ice and open water, the chance of a blowout occurring during these periods is not completely eliminated when oil is being produced.

As noted in the following section, the State of Alaska requires as a planning standard the greatest possible oil spill discharge that could occur from a blowout. Thus, this amendment evaluates the potential effects of a very large oil spill.

4.11.2 Blowout Assumptions

As described in Alaska Clean Seas Technical Manual, Volume 1 (Alaska Clean Seas 1999), the North Slope Spill Response Project Team (a joint industry-agency task force) specified that for oil spill planning purposes, flow rates to be used for wells in areas without adequate production history data (e.g., Planning Area) are estimated at 5,500 bbl/day. The North Slope Spill Response Project Team also specifies that for planning purposes, a 15-day blowout is to be assumed. In the Oil Discharge Prevention and Contingency Plan for the Alpine field, ConocoPhillips estimates a 7,500-bbl day flow rate for 15 days, for a total of 112,500 bbl. In this analysis, the 7,500 bbl/day flow rate is used, rounded up to 8,000 bbl/day for a total of 120,000 bbl for the 15-day period.

The potential impacts on specific resources are presented below. In each resource-specific analysis, the blowout hypothetically occurs in an area sensitive to that particular resource and releases crude oil into the environment for 15 days. For the scenario, the analyst places the blowout spill in the location most susceptible to the resource. The general environments into which the oil could discharge are tundra, ponds, lakes, creeks, rivers, and lagoons. The blowout could occur at any time of the year. The receiving environment could be solid ice, broken ice, or open water, as well as snow and open ground.

The following blowout assumptions are taken from oil discharge prevention and contingency plans from facilities on the Alaskan North Slope (PAI 2001; BP Exploration (Alaska), Inc. 2000, 2001a, b).

- The crude oil is assumed to be similar in composition to "Alpine field" crude oil.
- The theoretical facility is a 5-acre gravel pad.
- The gas/oil ratio ranges from 400 to 2,200 standard ft^3/bbl.
- The blowout spill rises into the air at an average rate of 300 bbl/hour (8,000 bbl/day divided by 24 hours).
- Oil droplets fall to the gravel pad and surrounding area in the direction of the prevailing wind.
- Assuming an Alpine field-like crude oil, approximately 30 percent of the 120,000 bbl evaporates into the air, leaving 84,000 bbl on or adjacent to the gravel pad and surrounding area.

The following figures are based on Alaska Clean Seas (1999) Tactic T-6, assuming a 6.3-inch pipe and the lowest and highest gas/oil ratios. The highest gas/oil ratio results in the higher values below. Of the oil falling to the surrounding environment:

- Eighty percent of the oil falls out from 300 feet (lowest gas/oil ratio) to 3,600 feet (highest gas/oil ratio) from the source, in a plume 100 feet (lowest gas/oil ratio) to 400 feet (highest gas/oil ratio) wide; and
- Twenty percent of the oil falls out from 3,600 feet (lowest gas/oil ratio) to 33,000 feet (highest gas/oil ratio) from the source, in a plume 400 feet (lowest gas/oil ratio) to 2,000 feet (highest gas/oil ratio) wide.

After 15 days from the start of the spill:

- 3,400 bbl remain on the gravel pad;
- 38,600 bbl have drained from the gravel pad into the environment; and
- 42,000 bbl have fallen to the surrounding environment (2,800 bbl/day).

4.11.3 Behavior and Fate of a Blowout Oil Spill During Various Seasons

During a blowout, oil would fall to the pad and surrounding area in a scattered pattern. Some of the oil falling to the pad would drain to the surrounding area. How the oil would behave after that would be dependent upon the season.

4.11.3.1 Winter

For a spill occurring during winter, oil would spread mainly on the surface of snow cover, ice, and/or frozen soil. No oil would enter open water as long as the ice remained solid. There would be little or no change in the oil's physical properties at very low temperatures and when buried under a snow cover. Blowing snow would tend to combine with pooled oil until the oil was effectively saturated with snow crystals.

The oil would not penetrate any ice surface. It would spread mainly on the surface of the frozen soil. It is unlikely to penetrate the lower layers of soil because the seasonal thawed layer would be absent (Chuvilin et al. 2001).

4.11.3.2 Fall Freezeup

Broken ice occurs in the Planning Area during fall freezeup and spring breakup. The scenario for this analysis assumes that oil would fall to the broken ice in a scattered pattern and would drain from the pad into broken ice in tundra ponds, lakes, streams, rivers, or lagoons. The ice would contain the oil somewhat and reduce spreading. Unless the oil was frozen into the ice, the evaporation rate would not change. Dispersion and emulsification rates would be lower in broken ice than in open water.

For a spill occurring during fall freezeup, the oil would freeze into the ice and slush before ice sheeting occurred. Winds and storms could break up and disperse the ice and oil until the next freezing cycle. These freezing cycles can be hours or days. In late spring and summer, this unweathered oil would melt out of the ice at different rates, depending on when the oil was frozen into the ice. In first-year ice, most of the oil spilled at any one time would percolate up to the ice surface over about a 10-day period. About mid-July, the oil pools would drain into the water. Thus, oil could be pooled on the ice surface for up to 30 days before being discharged from the ice surface to the water surface. The pools on the ice surface would concentrate the oil, but only to about 2 mm thick, allowing evaporation of approximately 5 percent of the oil—the part of the oil composed of the lighter, more toxic components of the crude. By the time the oil was released from the melt pools on the ice surface, evaporation would have almost stopped, with only an additional 4 percent of the spilled oil evaporating during an additional 30 days on the surface of the pond, lake, creek, stream, or river.

4.11.3.3 Spring Breakup

For analysis, it is assumed that a spill occurring during spring breakup would have the same behavior and effects as a summer or open-water spill. At spring breakup, the ice concentrations are variable. With high concentrations of ice, oil would spread between ice floes. As the ice concentrations eventually decreased to less than three-tenths of the water surface area, the oil on the water would behave as an open-water spill, with local oil patches temporarily trapped by the wind against ice floes. Oil on the ice floes would move with the ice as it responded to currents generated by the wind (S.L. Ross Environmental Research Ltd. 1998).

4.11.3.4 Summer

This scenario assumes that oil would drain from the gravel pad onto the tundra and/or open water, including lakes, ponds, creeks, streams, rivers, or lagoons. If oil were to fall on a water surface, the oil would move with the direction of flow and/or the winds. On the tundra, during the summer, the oil would spread less because of the cover of vegetation. Oil could penetrate the lower layers of soil because of their thawed condition. Rain could also increase the penetration of oil into the soil. The oil could spread laterally if it reached a permafrost lens or layer (Chuvilin et al. 2001).

4.11.4 Effects of a Low-Probability, Very Large Oil Spill

4.11.4.1 Air Quality

A very large (120,000 bbl) oil spill would affect nearby air quality locally and temporarily. Air quality effects would be caused by emissions from evaporation and from any burning associated with the oil spill or with oil-spill clean-up activities. Typical emissions from blowouts or other large spills consist of hydrocarbons (VOCs). Only fires associated with blowouts produce other pollutants, such as NO_x, CO, SO_2, and particulate matter. The scenario for a very low probability, very large oil spill assumes that the release of crude oil would continue for 15 days. Therefore, VOCs would continue to be released from the spilled oil for that length of time. The VOC concentrations would be very low and would normally be limited to an area of 0.4 to 0.8 mi^2. Moderate or heavier winds would further reduce the VOC concentrations in the air. Those VOCs would likely evaporate almost completely after the spilling ceased. Air pollution would be limited because of atmospheric dispersion. Air quality effects from a very large oil spill should remain quite localized and very temporary.

Effects on air quality from air emissions likely would be only a very small percent of the maximum allowable PSD Class II increments. The concentrations of criteria pollutants in the ambient air would remain well within the air quality standards. Consequently, there would likely be only a minimal effect on air quality with respect to the standards.

4.11.4.2 Paleontological Resources

Impacts to surface and near-surface paleontological deposits would likely be greater for a summertime spill than for one that occurred during the winter. While contamination of the deposit would render much of the data recovery valueless, the clean-up procedures would create even greater impacts. Since paleontological resources are nonrenewable, the effects could be substantial.

4.11.4.3 Soil Resources

Oil spills of any size could impact soils by altering vegetation. The oil alone would decrease plant growth, but oil spills probably would leave the surface organic mat intact. Spill cleanup, however, would be more likely to damage soils. Cleanups are not always well controlled; heavy traffic and digging are common and can result in damaged soils. Cleanup of oil spills would mitigate impacts to soils only if the clean-up methods and operations were very carefully controlled to minimize surface disturbance.

4.11.4.4 Water Resources

A very large crude-oil spill could have serious impacts to streams and lakes. While the petroleum residue from a spill could be flushed from most streams within a few years, the impacts to lakes and ponds could persist for decades. Additionally, a very large spill could saturate the tundra mat with oil, limiting the amount of crude oil that was recovered, and considerably lengthening the time over which impacts could occur. A spill that occurred in the winter could have similar impacts, although the snow and cold temperatures might retard the crude-oil runoff into the watershed and somewhat limit the contamination. A spill that occurred during spring breakup or fall freeze-up could have the greatest impacts, since it would be extremely difficult, if not impossible, to contain the spill when ice was either breaking apart or forming into semi-solid slush pans or jumble ice. Spill cleanup in the watershed would involve containing the spill, diverting or isolating it within the water body, skimming off the oil, and treating the remaining oil-contaminated water and sediments. Prevention and rapid response with adequate removal equipment would minimize effects.

For spills during frozen conditions, it is anticipated that oil would not reach open water. Following contaminated snow and ice removal, water quality impacts from the residual oil would be very limited in extent. However, even small quantities of oil remaining after cleanup could result in lethal and sublethal toxicity levels in waters within the spill area for approximately 7 years.

During summer, flat coastal tundra develops a dead-storage capacity averaging 0.5 to 2.3 inches (Miller et al. 1980) that would retain 300 to 1,500 bbl of oil per acre. Even at high water levels, the tundra vegetation tends to act as a boom and vegetation and peat as a sorbent, allowing water to filter through, trapping the more viscous oil (Barsdate et al. 1980) and also making recovery of the oil more difficult. On the other hand, even small spills can spread over large areas, if the spill event includes aerial, pressured discharge. For example, in December 1993, an ARCO Drill Site line failed and 1 to 4 bbl of crude oil misted over an estimated 100 to 145 acres (Ott 1997). For a large spill during breakup conditions or the summer season, oil-spill response likely would recover the bulk of spilled oil. However, sufficient oil could remain to result in lethal and sublethal toxicity levels in waters within the spill area for approximately 7 years. In addition, equipment used to contain and recover spilled oil could damage the tundra surface, potentially leading to thermokarst erosion and causing local water quality degradation.

4.11.4.5 Vegetation

The only reported blowout of crude oil on Alaska's North Slope occurred in 1950 (Fairweather E&P Services, Inc. 2000), and no crude oil was spilled off the pad during that blowout. There is no history of the effects of a very large spill of crude oil on North Slope tundra vegetation. Overall, past spills (of much smaller volumes) on Alaska's North Slope have caused minor ecological damage, and ecosystems have shown good potential for recovery, with wetter areas recovering more quickly (Jorgenson 1997, McKendrick 2000, NRC 2003). It is estimated that a spill of 120,000 bbl would cover up to 1,500 acres, with 80 percent of the oil falling out on less than 30 acres. From these numbers it is assumed that most of the vegetation affected would be impacted. A percentage of the vegetation affected would likely suffer longer-term consequences, suggesting that recovery would take longer and might not be as complete.

4.11.4.6 Wetlands and Floodplains

Biological resource areas that can be classified as having the function and value of wetlands and floodplains on the North Slope include vegetation soils, and water resources. Please refer to the discussions for each of these resources for information on the potential impacts of a very large spill.

4.11.4.7 Fish

Anadromous/Amphidromous Fish

As discussed in the analyses for the alternatives, oil spills have been observed to have a range of effects on fish; the specific effect depends on the concentration of petroleum present, the length of exposure, and the stage of fish development involved (eggs, larva, and juveniles are most sensitive; Malins 1977; Hamilton et al. 1979; Starr et al. 1981). If lethal concentrations were encountered, or if sublethal concentrations were encountered over a long enough period, fish mortality would be likely. Such a situation could occur during a large blowout spill if the spill were to enter a body of water with restricted water exchange. The worst-case scenario would be a spill that occurred at fall freezeup or at the beginning of spring breakup in the lower reach of one of the large rivers that flows into Harrison Bay. Cleanup of a spill when ice was either forming into slush pans or breaking apart would be difficult. Petroleum residue would persist through the winter (and beyond) if the spill occurred at freezeup. Compounding this problem is the likelihood that freshwater fish of all life stages would be congregating in this habitat to overwinter. Craig (1989a) calculated that the lower portion of coastal plains rivers on the North Slope provide most of the overwintering habitat for freshwater fish.

Though lethal effects of oil on fish have been established in laboratory studies (Moles et al. 1979; Rice et al. 1979), large kills following oil spills are not well documented, probably because toxic concentrations are seldom reached (Rice 1985). In this scenario, where it is assumed that a large quantity of oil reaches numerous fish and the oil is not rapidly diluted, a substantial portion of the water body's resident populations of fish species could be harmed or killed. Adults and juveniles might be able to avoid contact with oiled waters during a spill in the open-water season, but survival would be expected to decrease if oil were to reach a pool or series of pools isolated by ice and the fish were unable to avoid contamination. In the latter case, sublethal effects would be more likely to occur, and would include changes in growth, feeding, fecundity, and survival rates, and temporary displacement. Other possible effects would include localized reduction in food resources, and consumption of contaminated prey. Total fish loss would be dependent on the extent and duration of the contamination and the effectiveness of the spill cleanup. If the entire population of any given species in a drainage were spread out among overwintering sites in a river or adjacent lakes, the loss at any given site would not be expected to eliminate a population.

Marine Fish

A very large nearshore spill during the summer feeding period would likely result in moderate to high effects on some marine fish populations. Depending on the amount of oil deposited in the nearshore area during summer, and the amount of actual shoreline oiled, it is estimated that a 120,000-bbl oil spill would affect 5 to 20 percent of the marine fish population in the area. Both lethal and sublethal effects would be expected. Fishes farther offshore of the nearshore feeding area would likely not be affected. The occurrence of a very large spill during winter could have similar effects when released from the ice during the following spring. In either case, recovery would be likely in 5 to 10 years. If such a spill were to occur well offshore in summer, much of its effect would be reduced by weathering and the resulting reduction in the amount of oil reaching nearshore feeding areas. While the spill would still be expected to result in a moderate to high effect on some marine fish populations, its effect would likely be greatly reduced (estimated recovery of 3 to 5 years).

4.11.4.8 Birds

Effects of a Blowout Oil Spill on Birds

Throughout the summer and fall periods, many tens of thousands of long-tailed ducks, other waterfowl, loons, and seabirds are present for varying intervals in coastal lagoons and nearshore and offshore waters of the Beaufort Sea. Larger concentrations occur in areas east and west of the Planning Area than in areas offshore of the Planning Area (Johnson et al. 1993; Fischer et al. 2002; Ritchie et al. 2002). If a 120,000-barrel offshore spill were to occur in the Planning Area, when large concentrations of molting, staging, or migrating birds were present, thousands of birds could be contacted by oil, potentially resulting in a substantial loss of birds. A spill that spreads out of the Planning Area to adjacent coastal or offshore areas could impact a larger number of birds and could impact several thousand

nesting or postbreeding common eiders concentrated near barrier islands and in coastal lagoons. Other species likely to be affected by a large oil spill include scoters, northern pintail, Pacific loon, phalaropes, and glaucous gull. Red-throated and yellow-billed loons, whose ACP populations are relatively small, also could be affected. Although fewer individuals would be expected to be affected by an oil spill in the waters offshore of the Planning Area compared to offshore areas to the east and west, large numbers of molting and staging geese and shorebirds could be affected in coastal areas of the Planning Area.

A large spill occurring in August or September, and affecting a substantial proportion of the thousands of Ross's gulls that gather east of Point Barrow to feed each fall (Divoky et al. 1988), could result in a substantial loss of this species, whose world population most likely does not exceed 50,000.

A terrestrial spill from a pipeline in summer may enter lakes and streams used by waterfowl and shorebirds and could affect foraging and resting habitat. Oil from the feathers of incubating adults may cover eggs, reducing oxygen transfer through the shell and causing embryo mortality. Direct mortality to adult birds could occur through hypothermia after contact with oil or by ingestion of oil.

Blowout During Open-Water Conditions

Although spill containment, recovery, and clean-up techniques under ideal weather conditions may be effective, these conditions may not exist during a spill incident and some loon, waterfowl, shorebird, and seabird habitats are likely to be contacted by oil. Individuals or groups of birds are widespread in their offshore distribution, ranging from the shoreline to 30 miles or more offshore. If a large spill is not contained before reaching areas of bird concentrations, hazing tactics may help to reduce the number of birds that may be affected by the spill.

Containment, recovery, and clean-up activities for a large spill are expected to involve hundreds of workers and numerous boats, aircraft, and onshore vehicles operating over an extensive area for more than 1 year. Persistence of oil in the environment would vary depending on weather conditions and speed of containment, recovery, and cleanup. The presence of such a workforce is likely to produce hazing effects, by displacing birds from the immediate area of the spill. If a reliable system of locating bird concentrations in a specific area can be devised, specific birds or groups in danger of oil contact could be targeted with specific hazing tactics.

Displacement of female waterfowl with broods from coastal habitats by clean-up activity may have a negative effect if it prematurely forces them into the offshore marine environment where foraging may be more difficult for the ducklings. Disturbance of nesting sea ducks by onshore clean-up activities is not expected to have a major impact on their productivity unless disturbance happens in an area of concentrated nesting effort or to individuals with low and/or declining populations. Because of low nesting density of ducks along the coast, few nesting birds are likely to be displaced and potentially lose their clutches or broods to predators or exposure to weather as a result of disturbance by clean-up operations. Helicopter support traffic and human presence probably would be the most disturbing factors associated with oil spill clean-up activity.

Prompt containment and removal of oil from offshore areas, accompanied by hazing tactics targeting high-use areas, would likely to result in a substantial reduction of loon, waterfowl, and shorebird mortality from a large oil spill. Cleanup also would decrease the amount of oil available for uptake by bottom-dwelling organisms that are the principal food of sea ducks and shorebirds.

A 120,000-barrel oil spill in offshore waters of the Beaufort Sea could result in the loss of thousands of waterfowl and shorebirds utilizing habitats either in offshore areas or along the shoreline. Oil from an offshore spill that spread to areas adjacent to the Planning Area could impact more birds in those adjacent areas than in the Planning Area.

Blowout During Broken-Ice Conditions

Containment and oil recovery following a blowout spill that enters the marine environment under broken-ice conditions at meltout or freezeup is expected to be less effective than for an open-water spill. Under these

conditions the spill would be contained in a smaller area than a spill in open water, and fewer birds are likely to occupy broken ice unless areas of open water are available. However, Pacific loons, long-tailed ducks, king eiders, common eiders, and glaucous gulls have been observed in small areas of open water available under these conditions (Dau and Hodges 2003). Even after spring melting provides areas of open water, most arriving spring migrants likely would occupy overflow areas off river mouths, because those are available earlier and are in the vicinity of nesting areas. The hazing effect of clean-up activity or actively hazing birds to displace them from areas where oil is located may be counterproductive, because few alternative habitats are available to birds at this time. For sea ducks arriving via overland routes, the benefit of spill containment and cleanup would be minor until they begin reentering the marine environment following breeding. By this time, the oil would have weathered and would be expected to have minor impact to birds. Indirect effects resulting from intake of contaminated prey organisms may be higher under broken-ice than open-water conditions, because reduced cleanup capability would provide a longer interval for exposure and uptake by such organisms. Accumulation of oil in coastal marshes and adjacent habitats could present a hazard to departing males following breeding and females with young following nesting as they move to offshore areas. Prior to freeze-up, most sea ducks and other waterfowl and shorebirds are not likely to be present in great numbers, and oil present in areas with broken ice may have weathered and become less hazardous to birds. Long-tailed ducks, eiders, and glaucous gulls are at risk until later in the fall than most other species because they remain in the area longer than most other species.

A winter spill entering the environment during the ice-covered period could affect birds after the ice melts in the spring. Migrating loons and waterfowl concentrated in open water near river deltas or other nearshore areas could come in contact with oil or could feed on contaminated prey. Losses from a spill contacting terrestrial habitats would not be expected to result in substantial effects to bird populations.

4.11.4.9 Mammals

Terrestrial Mammals

For this analysis, it is assumed that a very large spill from a blowout would occur during the peak of the mosquito season within the TLH caribou insect-relief area north and east of Teshekpuk Lake. Any terrestrial mammals in the immediate vicinity of the blowout could be contacted by oil falling onto the surrounding tundra and open water. Loss of thermoregulation would not be a factor, except possibly in young caribou calves. Larger, more mobile animals such as caribou, bears, and moose would likely move out of the area affected by the blowout, reducing their exposure. Smaller, less mobile animals might not be able to move out of the affected area, resulting in greater mortality of these species. Some animals could be killed from exposure to toxins, either absorbed through the skin or ingested during feeding. Ingestion typically results in pulmonary aspiration that can be lethal or predispose the animal to infections. Terrestrial mammals would be temporarily disturbed or displaced by cleanup and site rehabilitation activities. At this time of year, TLH caribou would be aggregated into large groups for insect avoidance. If a blowout occurred in the vicinity of an aggregation, a relatively large number (100+) of caribou could be exposed to oil fallout. Movement of insect-harassed caribou in the vicinity of the blowout could be disrupted during the duration of the blowout and the following period of cleanup, reducing caribou foraging efficiency. If foraging efficiency was reduced enough to result in reduced weight gain, there could be greater over-winter mortality or a corresponding reduction in parturition the following year. This effect would only last for 1 season and would not result in long-term reduction in the population size unless followed or preceded by a few years of higher mortality or lower parturition from other factors. The amount of habitat affected by such a spill would be minimal when compared to the amount of caribou habitat available on the North Slope.

Effects from a Possible Very Large Blowout Spill in Marine Waters in the Colville River/Harrison Bay Area

For this analysis, it was assumed that a very large spill from a blowout would occur in the Colville River/Harrison Bay area. If the spill were to occur within Harrison Bay or along the shore during the summer open-water season, the spill would contaminate marine waters. Small numbers of spotted seals (fewer than 100) could be exposed to the spill. Smaller numbers of other marine mammals, such as ringed and bearded seals, polar bears, and beluga whales that generally occur offshore during the summer, could be exposed to oil if the spill were to spread

offshore. If spotted seals were to be oiled and suffer lethal effects from the spill, the small population could take a few years or more to recover. Losses of other marine mammals to the spill would likely be small (a few individual polar bears to perhaps 100 or fewer individuals of the other species), with recovery of populations expected within 1 year.

Effects from a Possible Very Large Blowout Spill Onshore in the Colville River Delta/Harrison Bay Area

For this analysis, it is assumed that a very large spill from a blowout would occur onshore in the Colville River Delta/Harrison Bay area. If the spill were to occur near Harrison Bay or along the shore during the summer open-water season, some of the oil would contaminate marine waters. Small numbers of spotted seals (perhaps 10 to 30 animals) could be exposed to oil from the spill. It is unlikely that other marine mammals, such as ringed and bearded seals, polar bears, and beluga whales that generally occur offshore during the summer would be exposed to the spill. If 10 to 30 spotted seals were to be exposed to part of the spill and suffered sublethal or lethal effects, the population could take a few years to replace these losses.

4.11.4.10 Threatened and Endangered Species

Bowhead Whale

If a very large spill were to occur at a well located along the northern coast of the Planning Area or along a river tributary to the Beaufort Sea, oil could enter the nearshore marine environment and potentially be transported to offshore areas. Under most circumstances, contact with whales migrating through offshore waters during the open-water season would be brief. In some years, however, bowhead whales have been observed very near shore between Point Barrow and Cape Halkett during the westward fall migration. For example, 77 individuals were observed feeding near the shoreline between Smith Bay and Dease Inlet in September 2000 (Treacy 2002a). If bowhead whales were feeding in an area when spilled oil was present, contact could be prolonged and some of the oil could be ingested. It is not known whether a brief exposure, especially of volatile components, would have effects on lung or eye function.

During their spring migration, bowhead whales often are concentrated in the spring lead system as they move through the Chukchi Sea, past Point Barrow, and eastward through the Beaufort Sea. This behavior makes them vulnerable to any oil entering the spring lead system. For example, a large spill occurring in late fall or winter could become entrained in the pack ice and the oil could be released into leads when the ice melted. However, a winter spill would likely melt out in July, so it is not likely that oil would be melted out of the ice in time to contact spring leads during the whale migration that spring. Oil released in broken ice conditions would be more difficult to clean up and more likely to enter the spring lead system. During the fall migration, oil from a meltout spill would be somewhat weathered and the toxic hydrocarbons at least partially evaporated before the oil entered the water. As a result of the weathering, the spill would be less likely to cause respiratory distress or other effects to bowhead whales surfacing to breathe.

Effects of an oil spill on bowhead whales would include oiling of the skin, inhalation of hydrocarbon vapors or oil, ingestion oil or contaminated prey, fouling of the baleen, reduction of food supply, displacement from feeding areas, and possibly death. The effect of fouling baleen has not been investigated adequately; the long filamentous bowhead whale baleen may be prone to more serious fouling than the coarser baleen of some other species, thereby depriving bowhead whales of a greater degree of normal function. The number of whales contacting spilled oil would depend on the timing and duration of the spill, ice conditions, effectiveness of containment and clean-up operations, and the whales' ability or inclination to avoid contact. Based on conclusions from studies that have examined the effects of oil spills on cetaceans, external exposure to spilled oil is unlikely to have serious effects on bowhead whales. Most whales exposed to spilled oil would likely experience temporary, nonlethal effects, although lethal effects to some individuals could occur.

Spectacled and Steller's Eiders

Male spectacled eiders, from mid- to late June to late July, and females, from late June to early September, may stage in offshore waters of the Planning Area prior to migration (TERA 1999; Fischer et al. 2002; Troy 2003). Some spectacled eiders would likely be affected by an oil spill in the waters offshore of the Planning Area. Oil from a winter spill that was released from the ice during spring break-up could affect migrating eiders in open water near river deltas; however, most spectacled eiders likely migrate overland in the spring and few birds would be affected. A summer spill could impact staging eiders prior to fall migration. The number of eiders affected potentially could total tens to low hundreds of individuals. Using average estimated spectacled eider density calculated from USFWS survey data in the central Beaufort Sea area from Harrison Bay to Brownlow Point, and average severity of spill-trajectory paths (and thus, exposure of birds to oil), a USFWS model estimated an average of only two eiders would be exposed to a large spill (5,912 barrels) within 30 days in July (Stehn and Platte 2000). However, in late July, one group of 100 individuals was observed, suggesting a potential for much higher mortality should a spill occur in an area of relatively high spectacled eider density. The greatest potential for spectacled eiders to be impacted by an offshore oil spill would occur in deeper offshore waters of Harrison Bay rather than in offshore waters to the east or shallower nearshore waters. An oil spill could also contaminate prey populations in eider foraging areas at any time of year that could result in secondary impacts on eiders, affecting productivity and/or survival. Likewise, negative effects of a spill on shoreline and coastal marsh habitat could affect eiders when the eiders are moving from onshore brood-rearing areas to the marine environment, or in subsequent years. Molting and staging spectacled and Steller's eiders are known to use the lagoon systems in offshore areas of the Beaufort and Chukchi seas and Norton Sound. Hundreds or perhaps thousands of spectacled eiders could be impacted by an offshore spill that occurred in areas of high bird use such as Kasegaluk Lagoon and Ledyard Bay in the Chukchi Sea and Norton Sound.

A large onshore spill released in the Planning Area during the summer season could affect pre-nesting, nesting, and brood-rearing spectacled or Steller's eiders. In the immediate vicinity of the spill, some habitat contacted by oil would become unsuitable for nesting, brood-rearing, or foraging, and oil entering freshwater aquatic habitats could spread more widely, including into river deltas and nearshore marine habitats. Direct mortality could occur from loss of insulating capabilities of feathers should eiders come in contact with oil, or by ingesting contaminated prey. Oil that may come in contact with eggs, either directly or through contact with partially oiled feathers of incubating adults, can negatively impact embryonic development.

Effects of Oil-Spill Prevention and Response

A spill that occurred during the summer open-water period would be expected to cause some Steller's eider and spectacled eider mortality. Most mortality would likely occur offshore where concentrations of staging spectacled eiders are greatest. Containment, recovery, and clean-up activities for a large spill would be expected to involve hundreds of workers and numerous boats, aircraft, and onshore vehicles operating over an extensive area for more than 1 year. The presence of such a workforce in open water conditions would be likely to act as a general hazing factor by displacing any eiders from the immediate area of activity and potentially away from areas contaminated with oil. Active hazing may also help to reduce the number of eiders that may be affected by an oil spill by targeting specific birds or groups in danger of coming in contact with oil with specific hazing tactics. Special areas of concern include important foraging areas for spectacled eiders located in marine waters adjacent to the Planning Area in Smith and Harrison bays.

Containment and oil recovery operations following a large spill that entered the marine environment under broken-ice conditions at meltout or freezeup would be less effective than for a spill in open water. A spill during the ice-covered period or during broken ice conditions may be less likely to spread than a spill occurring during the open-water period and few eiders would be expected to occur in offshore areas during periods with ice coverage. Many spring migrants likely would occupy open overflow areas off river mouths that are open early and are near nesting areas; the most effective response could be to focus containment and clean-up efforts in such areas. During the broken-ice season, the hazing effect of clean-up activity or the active hazing of eiders to displace them from contaminated areas could be counterproductive, because there are few alternative habitats that could be occupied at this time. Since most spectacled eiders arrive in the area via overland routes (TERA 1999), the benefit of spill

containment and cleanup would be greatest in nesting habitat. Indirect effects resulting from the intake of contaminated prey organisms could be higher under broken-ice than open-water conditions, because reduced cleanup capability could provide a longer interval for exposure and uptake by such organisms. Entrapped oil in coastal marsh and adjacent habitats could present a hazard to departing males after breeding and to females with young after nesting as they move to offshore waters. Few spectacled eiders are likely to be present in the offshore waters of the Planning Area by late September, and oil present in broken ice at this time likely would not impact many eiders.

Some mortality could also result in terrestrial or coastal habitats where post-breeding males or unsuccessful females or females with recently fledged young could be affected by an oil spill. An onshore spill in summer could enter lakes and streams used by eiders and could result in some mortality to nesting or brood-rearing eiders. As spectacled eiders nest in low densities, disturbance of nesting eiders by onshore clean-up activities would not be expected to result in large increases in nest abandonment or overall decreases in productivity. If clean-up activities were to displace females with broods from coastal habitats prematurely into the more saline offshore marine environment, it could result in decreased duckling survival. Helicopter support traffic and human presence would probably cause the greatest disturbance associated with oil-spill clean-up activity.

4.11.4.11 Cultural Resources

Because cultural resources in the Planning Area are located at or near the ground surface, a spill that occurred during the summer would have a greater effect on these resources than a spill that occurred during the winter. Oil spilled during winter, however, could impact cultural resources if the warm oil melted the snow and permafrost and impacted the underlying cultural resources. While the contamination of the cultural resources would render some of the data recovery valueless, the clean-up procedures would create even greater impacts. Since cultural resources are nonrenewable, the effects could result in loss of site integrity and loss of eligibility for the NRHP.

4.11.4.12 Subsistence

Effects on subsistence-harvest patterns from a 120,000-bbl oil spill could potentially displace and cause a functional loss of habitat to CAH, TLH, and WAH caribou. Effects to subsistence would occur as this important subsistence resource became unavailable or undesirable for use, or experienced long-term (more than 5 years) population and productivity effects. Exposure of bowhead whales to spilled oil could result in lethal effects to some individuals, injury to many more, and long-term contamination of the fatty tissues and possible chronic ill health for many of the whales exposed to the spill. Large numbers of spotted seals could be exposed to the spill and suffer losses, with population recovery taking several years, and hunters decreasing harvests of subsistence resources for many years due to contamination. Losses of other marine mammals should be smaller, with recovery occurring within 1 year. If a large spill were to occur when large concentrations of molting, staging, or migrating birds were present, tens of thousands of birds could be contacted by oil, representing a loss to regional populations and affecting subsistence and sports uses in the Y-K Delta as well as locations along the Pacific Flyway. A substantial portion of resident fish populations could be harmed or killed by a very large oil spill, and other populations could become contaminated. Access to subsistence hunting areas and subsistence resources and the use of subsistence resources could change if an oil spill reduced the availability of resources or altered their distribution patterns. Extra-regional efforts to acquire subsistence foods would be undertaken, possibly taxing the resources of other subsistence regions.

The communities of Anaktuvuk Pass, Atqasuk, Barrow, and Nuiqsut would be affected by a very large oil spill in the Planning Area. Even if few individual subsistence species were directly lost or displaced, a very large oil spill could potentially contaminate essential nearshore whaling areas and onshore terrestrial hunting and fishing areas, causing effects when the additive impacts from contamination of the shoreline, tainting concerns, cleanup disturbance, and disruption of subsistence practices are factored together.

4.11.4.13 Sociocultural Systems

Sociocultural systems in the communities of Anaktuvuk Pass, Atqasuk, Barrow, and Nuiqsut could undergo long-term individual, social, and institutional stress and disruption from a 120,000-bbl spill. It is expected that considerable stress and anxiety would occur over the loss of subsistence resources, contamination of habitat and subsistence resources, fear of the health effects of eating contaminated wild foods, fear of changes to harvest regulations (e.g., quotas), and the need to depend on the knowledge of others about environmental contamination (Fall 1992, McMullen 1993). Individuals and communities would be increasingly stressed during the time it would take to modify subsistence-harvest patterns by selectively changing harvest areas (if such areas were even available) and there would be increased costs and risks associated with travel and hunting in unfamiliar areas. Associated cultural activities, such as the organization of subsistence activities among kinship groups and the relationships among those who customarily process and share subsistence harvests, would also be modified or would decline.

A 120,000-bbl spill would be expected to affect individuals and social systems in ways similar to the effects of the *Exxon Valdez* oil spill. As shown by that spill, some individuals found a new arena for pre-existing personal and political conflict, especially over the dispensation of money and contracts. In the smaller communities, clean-up work produced a redistribution of resources, creating new schisms in the community and increasing social stresses. Many members of small communities were on the road to sobriety before the spill; after the spill, some people began drinking again, leading to the re-emergence of numerous alcohol-related problems (such as child abuse, domestic violence, and accidents). Institutional effects included additional burdens on local governments, disruption of existing community plans and programs, strain on local officials, difficulty dealing with Exxon, community conflict, disruptions of customary habits and patterns of behavior, emotional effects and stress-related disorders from confronting environmental degradation and death, and violation of community values (Endter-Wada 1992). Post-spill stress resulted from the seeming loss of control over individual and institutional environments, as well as from secondary episodes such as litigation, which produced secrecy over information, uncertainty over outcomes, and community segmentation (Smythe 1990). Attempts to mitigate social effects were often ineffective because of concerns over litigation, causing a reluctance to intervene out of fear that these actions might benefit adversaries in legal battles (IAI 1990b, 1998; Human Relations Area Files, Inc. 1994; ADFG 1995). In response to spill hazards, there has been a resurgence in traditional strategies for responding to resource shortages, which in traditional times, and following the spill, resulted in an increase in sharing, a renewal and strengthening of social connections with extended family members and friends, and a cooperative approach to subsistence activities within and between the most affected communities.

4.11.4.14 Environmental Justice

Alaska Iñupiat Natives, a recognized minority, are the predominant residents of the NSB, the area potentially most affected by Planning Area exploration and development. An oil spill could affect Iñupiat Natives because they rely on subsistence foods and there could be cumulative effects to subsistence resources and harvest practices. The greatest level of effects would be experienced by the Iñupiat communities of Barrow and Nuiqsut.

In the unlikely event that a large spill occurred and contaminated essential nearshore whaling areas and onshore terrestrial hunting and fishing areas, major environmental justice effects could occur, stemming from contamination of the shoreline, tainting concerns, clean-up disturbance, and disruption of subsistence practice. Oil-spill contamination and cleanup could potentially displace and cause a functional loss of habitat to CAH, TLH, and WAH caribou, as well. Such impacts would cause damage to subsistence resources, which would result in disproportionately high effects on Alaskan Natives. Oil-spill contamination of subsistence foods would be the main health-related concern. Most potential effects to subsistence resources and subsistence harvests would be mitigated to some extent, though not eliminated.

4.11.4.15 Coastal Zone Management

A very large spill would be very unlikely. If a spill of this size were to occur, the spill itself and the resulting clean-up activities could have effects on one or more subsistence resources and access to those resources in the vicinity of the spill.

The NSB Coastal Management Program policies relate to impacts that are "likely and cannot be avoided or mitigated" and "development that will likely result in significantly decreased productivity of subsistence resources of their ecosystems." An oil spill of this size would be accidental and the probability of such an event is very low. Therefore, it is not considered to be a "likely" event, and would not introduce conflict with policy standards.

The NSB CMP Best Effort Policy 2.4.5.1(b) states that access to subsistence resources can be restricted when there is no feasible and prudent alternative. This policy could pertain to clean-up activities. If it is determined that there are no feasible and prudent alternatives to these activities, there would be no conflict with this policy.

Based on the low probability of an oil spill event of this magnitude, and on compliance with existing regulations for spill prevention and response, existing management practices, and proposed lease stipulations and ROPs, no conflicts with CMP policies are anticipated.

4.11.4.16 Recreation Resources

The impacts to recreation and wilderness resources would primarily relate to reductions in aesthetic values and naturalness associated with visible oil sheen and residues on vegetation and water. The effects on recreation opportunities would be short term in nature and would dissipate as cleanup and rehabilitation proceeded. Effects on wilderness values would depend on the care taken with during the clean-up process. If the scars on the landscape from clean-up activities were effectively rehabilitated, the long-term effect on potential for Wilderness designation would be minor.

The likelihood of a large spill affecting the Colville River would depend on where oil and gas development occurred. A large oil spill could possibly impact water quality and outstandingly remarkable values, particularly wildlife, archeology, and paleontology, and, to some extent, recreation and geology. Impacts on archeology, paleontology and geology would likely depend on the care taken during clean up of the spill. Recreation values would recover over time. Such impacts would not change the determination that the Colville River is not currently suitable for designation as a Wild and Scenic River.

4.11.4.17 Visual Resources

A very large spill that occurred along the shore during the summer open-water season would have little effect on visual resources overall, as the spill would be confined to rocky beach areas or the immediate shoreline vegetation. The occurrence of a very large spill during the winter could have a similar effect if it were released from the ice during the following spring breakup. If a very large spill were to occur onshore in summer, visual resources would be impacted by the visible oil and the resulting damage to the underlying vegetation. However, spills would most likely occur on already disturbed areas such as drill pads and production areas and would not greatly increase the area already visually impacted.

4.11.4.18 Economy

No additional employment would be generated from cleanup of very small spills. Even larger spills of up to 1,000 bbl may not generate many additional jobs. Onsite workers doing other operations and other response personnel from the North Slope would clean up most small to medium-sized spills.

The estimate of employment used in this analysis for a very large spill of 120,000 bbl is based on the most relevant historical experience of a spill in Alaskan waters—the *Exxon Valdez* oil spill of 1989. The employment estimate is

based on a ratio of workers to barrels spilled in the *Exxon Valdez* spill. The *Exxon Valdez* spill was 240,000 bbl. This spill generated enormous employment that rose to the level of 10,000 workers doing direct cleanup work in relatively remote locations. Smaller numbers of clean-up workers returned in the warmer months of each subsequent year until 1992. The Planning Area spill scenario assumes the spill would occur on land, not near the Beaufort or Chukchi seas, and not on possible drainage systems near and leading to those seas. If the spill occurred on land not near a sea, the number of workers could be less than the proportional effort to clean up the *Exxon Valdez* spill. If the spill occurred on a drainage system near a sea, then the clean-up effort would likely be close to that required to clean up the *Exxon V*aldez spill. Based on the experience of this spill, an oil spill of 120,000 bbl would generate approximately 5,000 jobs for 6 months in the first year, declining to zero by the third year following the spill.

In the case of the *Exxon Valdez* spill, numerous local residents quit their jobs to work on the cleanup, often at substantially higher wages, which generated inflation in the local economy (Cohen 1993). Anecdotal information indicates that housing rents in Valdez in 1989 increased by 25 percent in some cases to 6-fold in others, and inflated rents continued into 1990. The NSB would not experience similar inflation effects because cleanup activities would be managed and staged out of existing enclave-support facilities. The number of workers actually used to clean up a possible 120,000-bbl oil spill would depend on a number of factors, including which procedures were called for in the oil-spill contingency plan; the level of preparedness (equipment and training) of the entities responsible for cleanup; how efficiently the cleanup activities were executed; and the degree of coordination between the numerous responsible entities.

4.11.5 Comparison of Alternatives

Under the various alternatives presented in this amendment, the risk of the occurrence of a very large spill and the likelihood that such a spill would contact specific resources would vary. The risk of a very large spill would be different under each alternative because the projected level of oil and gas activities and production would be different. The likelihood of a very large spill contacting specific resources would be different under each alternative because the area available for oil and gas leasing would be different. The potential impacts of a very large spill would not differ among the alternatives.

The likelihood of a very large blowout spill occurring would be highest under Alternative C because the greatest number of wells and the greatest volume of production are projected under that scenario. The likelihood of contact with surface resources would vary by resource. In general, the likelihood of contact would be highest under Alternative C because the greatest area would be made available for oil and gas leasing, exploration, and development.

Under Alternative B, about 20 percent fewer wells are projected to be drilled and about 20 percent less oil is projected to be produced than under Alternative C. Given these scenarios, it is assumed, therefore, that the risk of a very large blowout spill would be about 20 percent less under Alternative B than under Alternative C.

Under the No Action Alternative A, about 70 percent fewer wells are projected to be drilled and about 75 percent less oil is projected to be produced than under Alternative C. Given these scenarios, it is assumed, therefore, that the risk of a very large blowout spill would be about 75 percent less under the No Action Alternative than under Alternative C.

4.12 Possible Permanent Roads

4.12.1 Scenario for a Possible Permanent Road Within the Planning Area

The scenarios for the alternatives evaluated in this amendment assume that permanent roads supporting oil and gas operations within the Planning Area are unlikely beyond that which ConocoPhillips currently proposes and that ice roads would be built to support oil and gas activities within the Planning Area.

A permanent road within the Planning Area would not be economically feasible under current economic and technological conditions. New oil and gas discoveries, changing economics, developing technologies, material availability, and the time constraints on ice roads are all factors that might influence the feasibility of "roadless" development versus the use of permanent roads.

The use of ice roads has logistical limitations. Heavy equipment cannot begin construction of ice roads until snow and permafrost reach sufficient depth to protect the tundra surface. Construction of ice roads is a time-consuming process, as the road alignment must be surveyed, permits for water use obtained, and the ice built up layer-by-layer. The time needed to construct an ice road of many miles to a drill site and the time needed to move heavy equipment back along the ice road before spring breakup reduce the amount of time available for winter drilling activities. Because of these time constraints, the feasible limit for use of ice roads is 50 miles over land and 100 miles over the bottomfast ice zone offshore. For production activities, an ice road would need to be constructed each year and alternate access (e.g., aircraft landing strip) would be needed to support operations during the summer.

Staging facilities could be established within the Planning Area. It would also be possible for lessees to store equipment year round in the existing oil fields. It is extremely costly to build ice roads over long distances, and the timing of when construction can begin is weather-dependent and unpredictable. While building a permanent road from staging facilities to possible drill sites would also be very expensive and difficult, such a road could be built.

For this analysis, the following assumptions are made for a possible permanent road within the Planning Area:

- The hypothetical road would be a 75-mile road from Nuiqsut to the northeastern part of the Planning Area (the high oil and gas potential area);
- Forty-eight thousand cubic yards (yd^3) of minerals materials would be required for each mile of road (a total 3.6 million yd^3 for a 75-mile road);
- Deposits with suitable quantities of mineral materials (sand and gravel) have been identified near or within the Planning Area (Clover Potential Gravel Source and ASRC site; USDOI BLM 1981), but the amount of material projected to be available at these two sites would not be sufficient to meet existing needs and those of the proposed road; thus materials would have to be brought to the road-construction site by barge and/or truck via ice roads;
- Interlocking mat systems might be used for construction of the road; these materials would have to be brought to the road-construction site by barge and/or truck;
- Four and one-quarter acres would be covered by each mile of road;
- Bridges would be required for crossing of major rivers; and
- The road would be funded and built by lessees and closed to the general public (i.e., the road would be for use by the oil and gas industry and local access only).

4.12.2 Scenario for a Possible Permanent Road Connecting Northeast National Petroleum Reserve – Alaska to Outside of the Planning Area

The scenarios for the alternatives evaluated in this amendment assume that a permanent road connecting Planning Area oil and gas fields to existing oil-field infrastructure to the east (e.g., Nuiqsut, Kuparuk field, or Alpine oil field) is unlikely. The BLM believes these scenarios are realistic. The 1998 Northeast IAP/EIS prohibits permanent roads connecting Northeast National Petroleum Reserve – Alaska facilities to an outside road system. Lease Stipulation 48 for the Northeast National Petroleum Reserve – Alaska states, "Permanent roads (i.e. gravel, sand) connecting to a road system or docks outside the Planning Area are prohibited, and no exceptions may be granted" (USDOI BLM 1998).

A permanent road across the Planning Area would not be economically feasible under current economic and technological conditions. However, the ADOTPF is proposing to construct an all-season gravel road from the Spine Road at the far western terminus (near the Tarn development) of the Kuparuk River Unit road system and proceed westward to a crossing of the Colville River 3 miles south of Nuiqsut. The road would ultimately link to the community of Nuiqsut. The project would also include development of one or more material sites in the area.

4.12.3 Effects

4.12.3.1 Air Quality

The construction of a permanent road would have a very minor favorable effect on air quality by eliminating the repetitive yearly construction and time-concentrated heavy use of ice roads. Some air quality effects would occur during the construction of the road from emissions from heavy equipment and vehicles used in the road-building work. Some effects would occur from subsequent vehicle use of the road. All of the emissions are expected to be very localized and temporary, except possibly dust. Road construction crews could reduce dust during construction by moistening the exposed surface. Similarly, moistening the road surface during periods of heavy use would reduce blowing dust. Air quality should remain well within ambient air quality standards and PSD limits.

4.12.3.2 Paleontological Resources

The greatest potential impact in the Planning Area would be the construction of a permanent road(s). It is very likely that the road(s) would be built from locally or regionally available mineral material that, because usable deposits of mineral material are rare in the Planning Area, but are also the most common preservation medium of fossil remains, it is very likely that the deposits from which the material would be mined would contain Pleistocene vertebrate fossils and possibly Cretaceous-age vertebrate fossils. These types of paleontological remains are much rarer and of greater value than marine invertebrate or plant fossils. Paleontological resources are nonrenewable. The mining of mineral materials could either cause them to be destroyed or remove them from their natural context, thereby compromising or negating their scientific value. Even if the mineral material were not mined within the Planning Area, it would have to come from somewhere nearby, adding to the possible cumulative impacts within the region.

The construction of a 75-mile-long road would bury the surface of the route with approximately 48,000 cubic yards of mineral material per mile and cover a total area of roughly 320 acres. The 320 acres is a very small portion of the Planning Area. However, the road is not a block area but rather a transect across a portion of the Planning Area. While the total area affected is the same, the impact of a 75-mile-long road is potentially much greater than that of a block area, simply because the road traverses an extensive segment of the landscape rather than impacting a single, constrained locale. Construction of the road with an interlocking mat system rather than mineral material would decrease potential impacts to paleontological resources to some degree because no mineral material deposits would be mined. However the impacts of laying down the mat system across the landscape would be equal to or possibly greater than that of laying down a roadbed comprised of mineral material. While deeply buried

paleontological deposits would be protected from the impacts associated with construction of a permanent road, near-surface and surface remains would not.

It is likely that during surveys of probable road routes and mineral material sources, conducted before the start of construction, many of the surface (and some of the near-surface) paleontological remains would be identified, allowing most of the known locales of such remains to be avoided. Since, paleontological resources are not ubiquitous in the Planning Area and it is impossible to predict their location on the landscape to any meaningful degree, it is extremely difficult to assess the probability of impacts to the paleontological resources that could result from the construction of a permanent road. The route and location of the road(s) as well as the value or significance of the resource, information that is not available at this time, are needed to assess the level and degree of potential impact. With these limitations in mind, it is assumed that the probability of physical impacts to valuable paleontological resources resulting from road construction would be a reasonable possibility, though not a likelihood.

4.12.3.3 Soil Resources

The extraction of mineral materials for road construction and subsequent burial of soils by permanent roads would likely result in the permanent loss of soils in those areas that were directly affected. Permanent roads could also have detrimental effects on soils because of changes in stream banks, blockage of natural drainage patterns, and thermokarst erosion. Blockages and damming can increase soil loss through the cutting action of cold water during periods of high water flow. Blockages and damming can result in the thermal erosion of ice rich soils. These losses would amount to a permanent and irretrievable loss of soil resources.

The construction of a 75-mile-long road would result in the direct loss of about 320 acres of soils buried by the road. The area of direct impact (as a proportion of the Planning Area) is very small, less than 0.01 percent. A 18-mile road east of the Planning Area would result in soil losses of about 75 acres. Although the use of an interlocking mat system would reduce the need for mineral material, it would not reduce the overall area of soil resources loss.

Over the long term, it is possible that the construction of roads could reduce overall cumulative soil impacts. Traditionally, there has been unregulated and dispersed low-technology overland summer travel by local residents in the National Petroleum Reserve – Alaska. The application of new technology to traditional travel can cause problems for soils. For example, the use of off-highway vehicles, as economic conditions change and human population increases, has a greater impact on the soil than walking, the mode of transportation that OHVs replaced. A well-planned, permanent road system could have the net effect of increasing the opportunities for exploration, development, and individual access to the land (some of which is private) and could limit the overall impact to soils outside the acres directly affected by road construction.

4.12.3.4 Water Resources

The effects of permanent gravel roads on water could include disturbance of streambanks or shorelines and subsequent melting of permafrost (thermokarst); blockages of natural channels and floodways that disrupt drainage patterns; increased erosion and sedimentation; and removal of gravel from riverine pools, lakes, and floodplains (Walker et al. 1987a, b). A gravel road could create water impoundments and thermokarst erosion—equivalent to approximately twice the area directly covered by the gravel—up to 800 acres.

Unlike ice roads, gravel roads and pits would create long-term impacts over the life of the field(s). Since gravel roads could severely impact natural drainage patterns (creating flow diversions, impoundments, and thermokarst erosion), limiting the length of permanent roads and requiring that they have approved drainage plans would help to reduce impacts to water resources. Limiting development on floodplains and wetlands would ensure compliance with Executive Orders 11988 and 11990 that direct federal agencies to minimize the destruction, loss, or degradation of floodplains and wetlands.

The road could affect water quality in several ways, depending primarily on the type of construction (i.e., gravel versus an interlocking mat system). As explained below, roads on mats would probably alter some ponds and streams up to 800 acres for several years, causing a measurable (though minor) effect on water quality. Gravel roads would block some down-slope movement of water, creating small impoundments for several decades, and the dust from gravel roads would increase local water turbidity for as long as the road was heavily used.

An interlocking mat system has been used for temporary drill pads on the tundra. Two advantages of the system are that water turbidity would not be a problem as it would from gravel construction, and the impact on the tundra would probably persist for a relatively short period of time (compared to gravel fill). The duration of the impact is hard to determine because mat systems have apparently not been used for several years in one place. A mat system without a very effective insulation layer would probably increase the summer soil temperature under the mats over a period of years. Increased summer temperature would cause some melting of the tundra permafrost (or thermokarsting), leading to the formation of some new ponds and streams, which could influence the permafrost temperature further. The duration of impact of ice pads that have been insulated and used for more than one winter is only a few years (McKendrick 2000). A mat road of about 75 miles in length would create some new ponds and streams within about 4.25 acres per road mile (or about 320 acres) for a few years.

If the roads were constructed with gravel (usually about 5 to 7 feet thick), there would be almost no effect on the permafrost temperature, but there would be other effects. The assessment for the 1998 Northeast IAP/EIS concluded that the primary water-quality effect from construction and placement of gravel structures would be related to up-slope impoundment of water (USDOI BLM and MMS 1998). If standard North Slope construction practices were followed, culverts would be used to reduce impoundment, but roads might block some down-slope movement of water, creating small impoundments and, as noted by McKendrick (2000), drying the down-slope substrate. The impoundment effect would be very localized, but would persist as long as the gravel fill (for several decades).

Gravel roads also would also likely increase water turbidity, for two reasons. Culverts tend to concentrate flows that would otherwise be dispersed over a wider area—the concentrated flows being more likely to cause erosion of ice-rich soils—and, consequently, might increase turbidity (as explained in USACE 1997b). Secondly, dust fallout could also increase water turbidity. The fallout from heavily used gravel roads can be substantial; for example, up to 10 inches of dust was measured next to a major North Slope road (McKendrick 2000).

4.12.3.5 Vegetation

The impacts of permanent roads on vegetation would be similar to those from gravel pads and roads within oil field developments, as described in the analyses for the alternatives. These impacts would include the destruction of vegetation as a consequence of direct burial under gravel and the alteration of plant species composition in areas immediately adjacent to the road. The latter would be a consequence of dust or gravel spray and changes in moisture regimes from drifted snow or the blockage of natural drainage patterns.

A 75-mile road within the Planning Area would bury about 320 acres of land and alter the adjacent vegetation on about another 700 acres. As long as roads and other developments were sited to avoid populations of rare plants, they would not be likely to affect the continued existence of any plant species or community types.

4.12.3.6 Wetlands and Floodplains

Biological resource areas that would be classified as having the function and value of wetlands and floodplains on the North Slope included vegetation, soil, and water resources. Please refer to the discussions for each of these resources for information on how they could potentially be impacted by permanent roads.

4.12.3.7 Fish

A road connecting the Planning Area to Nuiqsut could result in impacts to freshwater fish. Potential impacts would be related to gravel extraction, disruption of fish movements due to altered flow patterns, and sedimentation and contamination of habitat.

Material sites (for gravel extraction) needed for construction of roads have not been identified in the Planning Area. A potential source would include river floodplains and channels. Given that the road would likely cross rivers close to overwintering and spawning habitat (lower reaches of major rivers), gravel removal from river beds could result in localized loss of spawning and overwintering habitat (loss of suitable substrate and overwintering pools). Road construction would have the potential to alter flow patterns to, and within, waterbodies. Bridges, culverts, low-flow crossings, and the road itself could interfere with fish migrations to spawning, feeding, and overwintering sites if improperly designed. Concerns related to road placement include diverting or eliminating flow from small tributaries that connect lakes or connect lakes and rivers. Potential loss of migratory capacity could stress or kill fish if they were unable to migrate to food-rich habitat in the summer, reach spawning areas, or move into overwintering habitat. Another potential impact during road construction is erosion and subsequent instream sedimentation. Direct threats to fish from sediment could include loss of physical habitat and decreased reproductive success. Embedded sediments could fill interstitial spaces and essential winter habitat used by juvenile fish. Filling of pool habitat would further limit overwintering sites for adult and juvenile fish. Developing eggs could be smothered and newly hatched fry could be killed by suspended sediment, which would prevent emergence from spawning gravel and interfere with respiration. In instances where stream reaches were aggrading due to heavy sediment loading, physical habitat would be further degraded when flows were redirected and eroded channel banks. Once built, a road would increase the chance of contaminant spills and subsequent impacts to aquatic habitat and resources. While impacts from gravel extraction, sedimentation, and altered flow patterns should be minor if adequate controls were in place, potential impacts from contamination would exist for the life of the road.

Marine Fish

The effect of a permanent road on marine fish would depend on the road's location, size, and design characteristics. Construction of a road in nearshore waters could affect the movement of some coastal marine and migratory marine fish, since they commonly feed and migrate in nearshore waters during the summer months. However, road construction would be expected to occur on land, and would have minor to no effect on marine fish. While an onshore road could affect some individual marine fishes, either directly (e.g. burial of nearshore marine habitat), or indirectly (e.g. increased turbidity), an onshore road would be unlikely to have a measurable effect on marine fish populations. If some portion of the road were to extend into marine waters, engineering it to provide for the unrestricted movement of nearshore marine fish should reduce the effects to fish in the immediate area of the road to short-term avoidance effects during the construction phase, with only minor effects expected on fish populations. Otherwise, marine fish in the vicinity of the road would likely be affected by restrictions in access to feeding and migrating areas.

4.12.3.8 Birds

The route of a permanent road connecting Nuiqsut or Barrow with oil field infrastructure would be likely to pass through or adjacent to important breeding habitat in the Planning Area for loons, waterfowl, and seabirds. A route from Barrow or Nuiqsut through the Goose Molting Habitat Area north of Teshekpuk would have the potential to cause disturbance effects that could impact high population density areas for greater white-fronted goose, brant, northern pintail, red-throated loon, Sabine's gull, and large shorebirds. Canada and snow geese also use this area during the molting period. A road located on tundra east of Teshekpuk Lake could impact high use areas for tundra swans, northern pintail, long-tailed ducks, and king eiders. A permanent road west of Teshekpuk Lake could impact high use areas for large shorebirds, Pacific and yellow-billed loons, tundra swan, and northern pintail. Areas of high use for northern pintail, king eiders, and long-tailed ducks are located south of Teshekpuk Lake. In winter, ptarmigan, and potentially snowy owl and gyrfalcon, could be disturbed in any of the areas. While it is likely a

road would be constructed in winter, a mat system could be constructed during the summer season. Post-construction impacts on birds during the breeding season may result from: 1) vehicle and personnel traffic causing noise, visual, and/or dust disturbance along the road; 2) stream drainages or other aquatic habitats altered by the road presence; 3) greatly increased access to areas surrounding the road corridor for those engaged in waterfowl hunting or disturbance-causing activities; 4) physical and physiological contamination from fuel/lubricant spills that enter aquatic habitats; and 5) direct loss of habitat from placement of gravel. New subsistence harvest laws could increase the potential for impacts to waterfowl in areas where permanent roads allow increased access to subsistence hunters.

Overall, it is likely that bird use of habitats near a road would be altered, and the effects of road presence would vary considerably among species and by time of year (Troy 1986, Troy and Carpenter 1990, TERA 1993). Effects may be especially widespread among shorebirds. Disturbance from increased activity associated with a road would be the most important source of effects. The most likely result of disturbance from road traffic during the breeding season is for species that are intolerant of noise and human presence to seek out more distant nesting and brood-rearing habitat. Those species with highly specific breeding habitat requirements presumably would experience more difficulty locating appropriate alternate habitat, causing greater disruption of breeding season schedule, with possible effects on productivity, at least in the short term. Activity-tolerant species are likely to experience less disruption of their breeding activities. Troy (1988) and TERA (1993b) reported that all shorebirds, except red-necked phalarope, were present at lower densities near roads than away from them during the breeding season. This avoidance did not persist into the post-breeding season, when densities were highest near roads. Red-necked phalaropes were more numerous along roads, an effect probably related to dust and early snowmelt, although phalaropes may have been attracted to thermokarsted areas near roads and pads (Rodrigues 1992). Dust fallout is highest along the side of a road that is more persistently downwind, causing earlier snowmelt in spring and thus earlier availability of nesting habitats. In general, road presence may result in displacement of birds on a local scale, but probably would have relatively little effect on bird abundance in the region.

Potential impacts to aquatic habitats altered by the presence of roads could negatively impact some birds. The creation of impoundments adjacent to roads and pads could be beneficial to some species. Impacts related to habitat alteration of wetlands adjacent to roads and pads would not be expected to have population effects. In the absence of restrictive regulations, local non-oil and gas-related activity (e.g., waterfowl hunting) would be expected to have effects on bird populations, but insufficient data are available to determine the level of these impacts. However, contamination of waterfowl feeding habitat from lead shot has been implicated as a factor that may be responsible for declines in some bird populations. During winter, disturbance effects would be minor.

4.12.3.9 Mammals

Within the Northeast National Petroleum Reserve – Alaska Planning Area

If a permanent road were to connect from oil fields to Nuiqsut and the Spine Road, there would be impacts to terrestrial mammals. Potential impacts would include disturbance during construction, disruption of movements or migration, accidental mortality, and loss of habitat. Grizzly bears, wolves, wolverines, foxes, and small mammals could be disturbed during construction of the road or accidentally killed by vehicles after construction was complete. A minor amount of habitat would be lost due to road construction. Impacts to moose and muskox would be minimal given their low densities within the northern part of the Planning Area. The species most likely to be affected by construction of a permanent road would be caribou. Construction of a road from Nuiqsut to the northern portion of the Planning Area could cross the TLH caribou insect-relief area, and would disrupt movements of insect-harassed caribou between insect-relief areas and foraging areas. In addition, such a road would interfere with movements of TLH caribou between the calving grounds and other parts of their range. Construction of a road from the central or southern part of the Planning Area would be less disruptive during insect season, but would also interfere with movements of TLH caribou from wintering areas to calving grounds east of Teshekpuk Lake. Wintering TLH caribou could be temporarily disturbed by traffic. Smaller, less mobile species with small home ranges, such as squirrels, voles, and lemmings could be affected in larger numbers; however,

there would be no population-level impacts on these species. Impacts to mammals would continue for the life of the road and would be dependant upon traffic levels.

Marine Mammals

A permanent road connecting potential development sites in the Planning Area to shore base and staging areas would not likely result in disturbance of beluga whales, ringed seals, or bearded seals because these animals infrequently approach nearshore habitats where noise associated with construction or traffic on such a road could be expected. Noise and visual presence of personnel during construction or use of a road, or use of an associated shore base for equipment offloading and staging, could potentially affect the behavior of spotted seals and polar bears. Seals are found in the Colville River Delta and Harrison Bay during the summer, and polar bears may occur in coastal areas in any season. Barge traffic to a shore base served by a road could potentially disturb a few individuals of these species, although it would be considered a rare event. A permanent road from the Planning Area to Nuiqsut, and from the Spine Road to Nuiqsut, would not impact any marine mammals. Disturbance effects associated with the presence of a permanent road would be likely to be negligible for marine mammal species.

4.12.3.10 Threatened and Endangered Species

A permanent road connecting potential development sites in the Planning Area to Nuiqsut would likely pass through or adjacent to important spectacled and/or Steller's eider breeding habitats. The Nuiqsut route would not be likely to affect many Steller's eiders. The Nuiqsut route could impact spectacled eiders in high use areas north of Teshekpuk Lake. In winter, these species are absent from the Planning Area. While it is likely that a road would be constructed during winter, a mat system could be constructed during the summer season. Post-construction impacts on eiders during the breeding season could result from: 1) vehicle and personnel traffic causing noise, visual, or dust disturbance along the road; 2) stream drainages or other aquatic habitats being altered; 3) greatly increased access to areas surrounding the road corridor for those engaged in waterfowl hunting or disturbance-causing activities; and 4) physical and physiological contamination from fuel/lubricant spills that enter aquatic habitats.

It is likely that after road construction, eiders may use adjacent habitats. Disturbance from increased activity associated with a road would be the most important source of effects. The most likely result of disturbance from road traffic during the breeding season would be displacement of eiders from habitats near roads, although some birds may become habituated to road disturbances. In the Prudhoe Bay area, spectacled eiders have been reported nesting near roads and oil field facilities (TERA 1996). Early green-up near roads and pads may attract eiders during the spring before other habitats become free of ice and snow.

Potential impacts to aquatic habitats altered by the presence of roads could negatively impact some eider habitat, but the creation of impoundments adjacent to roads and pads could be beneficial to eiders (Anderson et al. 1992; Warnock and Troy 1992). Impacts related to habitat alteration of wetlands adjacent to roads and pads would not be expected to have population-level effects to eiders. In the absence of restrictive regulations, local non-oil and gas-related activity (e.g., waterfowl hunting) would be expected to have effects on spectacled and Steller's eiders, but insufficient data are available to determine the level of these impacts. Contamination of waterfowl feeding habitat from lead shot, however, has been implicated as a factor that may be responsible for the spectacled eider population decline in the Y-K Delta (Flint and Grand 1997; Flint et al. 2000).

4.12.3.11 Cultural Resources

As with paleontological resources, the single greatest potential impact to cultural resources in the Planning Area is the construction of a permanent road(s), assuming that the road(s) would be built from mineral material that is locally or regionally available. Most prehistoric and historic cultural resource sites that are the result of past human activity on the North Slope lie on relatively well-drained ground. As a result, gravel deposits that have surface exposure generally support one or more cultural resource sites. There are other relatively dry locales (such as stabilized sand dunes and pingos) that occur on the landscape with much greater frequency than gravel deposits.

Many of these landscape features also support cultural resource sites. However, mineral material deposits appear to have been the most sought after and regularly used camping locales. Mineral material deposits in the region are rare, and deposits with surface exposures are rarer still, making almost any deposit worth mining for roadbed material. As a result, the potential for impacting cultural resource sites would be high if the road(s) were to be constructed of local/regional mineral material. Surveys of probable mineral material sources conducted before the start of construction, however, would be expected to identify many of the surface (and some near-surface) cultural remains.

Like paleontological resources, cultural resources are nonrenewable, and mining mineral material could either cause them to be destroyed or remove them from their natural context, thereby compromising or negating their scientific value. Even if the mineral material were not mined within the Planning Area, it would have to come from somewhere nearby, adding to cumulative impacts within the region. In addition to the potential impacts to cultural resources from the mining of the more than 3.6 million cubic yards of mineral material necessary to construct a 75-mile road within the Planning Area, the building of the road itself could cause further impacts to cultural resources.

The construction of a 75-mile road would cover the surface of the route with approximately 48,000 yd^3 of mineral material per mile, thus burying any cultural sites within the right-of-way. The proposed 18-mile route between the Colville River and Kuparuk River Unit Spine Road would require an additional 864,000 yd^3 of gravel. Cultural sites that lie on the surface could be destroyed or otherwise disturbed by this process. Near-surface cultural sites could survive the burial episode with little negative impact to their physical integrity, but would be lost as the result of being buried. However, surveys of probable road routes conducted before the start of construction would identify many of the surface (and some subsurface) cultural remains, which would help to effectively mitigate for impacts of construction. The construction of a 75-mile-long road would cover/bury a total area of roughly 320 acres; the 18-mile route an additional 75 acres. However, the road is not a block area but rather a transect running across the landscape of the Planning Area. While the total area affected would be the same, the impact of a 75-mile road would potentially be much greater than that of a block area simply because the road would traverse an extensive segment of the landscape, and would therefore have the potential to impact many more cultural resource sites than would the burial of the surface of a single block of 320 acres of tundra.

Construction of a road utilizing an interlocking mat system rather than mineral material would decrease potential impacts to cultural resources to some degree, because no mineral material deposits would be mined. However, the impacts of laying down the mat system across the landscape would be equal to, or possibly greater than, that of laying down a roadbed comprised of mineral material. Surveys of probable road routes conducted before the start of construction would be expected to identify many of the surface (and some of the near-surface) cultural remains, allowing most of the known locales of such remains to be avoided or impacts to them be otherwise mitigated. Since cultural resources are not ubiquitous in the Planning Area, though they are somewhat more predictable than paleontological deposits, and it is difficult to predict their location within the Planning Area to a reliable degree, it is extremely difficult to assess the probability of impacts to the cultural resources that would result from the construction of a permanent road. The route and location of the road(s), as well as the value or significance of the resource are needed to estimate the level and degree of potential impact. With these limitations in mind, it is assumed road construction could affect valuable cultural resources.

4.12.3.12 Subsistence

There is great concern among Iñupiat that subsistence and cultural sites could be damaged by a permanent road. In the BLM's 1979 Section 105 (c) study of National Petroleum Reserve – Alaska, the Iñupiat Community of the Arctic Slope stated in *The Iñupiat View*: "Areas identified in the TLUI (Traditional Land Use Inventory) as critical to subsistence or cultural sites should be off limits to any oil and gas exploration and development activities, including transportation systems. Activities proposed outside these sites should be evaluated on a case-by-case basis in close cooperation with local residents and representatives of the Borough and ICAS; for in order to mitigate the effects of such disruption and alien uses, in a special environment of great significance to many people, requires special knowledge that only we can provide" (USDOI BLM 1979a).

In Hall's 1983 subsistence study for the proposed Brontosaurus exploratory well, many Iñupiat were interviewed about their concerns regarding potential impacts from the project. The most important factor was the potential contamination of the local watershed and subsequent impacts on local fisheries. These observations suggest that local subsistence-based communities would have major concerns with a potential permanent road between development sites in the Planning Area. This road could compound run-off impacts over a much more widespread area, potentially affecting important resource habitats such as lakes, streams, and major rivers and threatening local subsistence fisheries.

Residents in North Slope communities have reported that building land links between local communities and other regions of the North Slope would not be desirable because: 1) they appreciated the quality of life afforded them by semi-isolation; 2) they believed that roads would have a negative impact on wildlife resources; and 3) they worried that road access would increase liquor imports into "dry" villages (ACI et al. 1984).

Walker et al. in their 1987 paper *Cumulative Impacts of Oil Fields on Northern Alaska Landscapes* found: 1) major landscape impacts from Prudhoe Bay development; 2) that indirect impacts such as thermokarst may not develop until many years after initial development; and 3) that the total area covered by direct and indirect impacts can greatly exceed the area of planned development. According to Walker et al. (1987b), "There is a need to develop methods to assess cumulative impact and to foster comprehensive regional planning to anticipate the large impacts that are likely to occur on the coastal plain in the next few years." A permanent road would represent "large" impacts and would call for a massive planning effort, accompanied by the gathering of all necessary baseline data along any potential route.

In a 1987 USFWS study that compared the actual and predicted impacts of TAPS, researchers concluded that:

> Fish and wildlife habitat losses resulting from construction and operation of the Pipeline System and Prudhoe Bay oil fields were greatly underestimated in the [USDOI's 1972 Final] EIS [on the Trans-Alaska Pipeline]. They included the direct losses of 22,000 acres from gravel fill and excavation, the even greater indirect losses of habitat quality due to the secondary impacts of construction (dust, siltation, erosion, impoundments, contaminants, etc.), and the blockage of fish and wildlife access to habitat by roads, pipelines, and causeways. Some of these indirect impacts were not predicted in the EIS, and the observed magnitude and frequency of others were greater than expected. Although some effort has been made to reduce habitat loss (through siting, consolidation of facilities, culverting, etc.) rehabilitation efforts along the Pipeline System have resulted in little restoration of habitat values. A lack of predictive capability may be expected whenever development moves into new geographical areas.

Potential permafrost loss and hydrological changes related to global climate change could compound impacts to subsistence harvests and resources from road construction and maintenance. The thawing of permafrost and associated increased maintenance costs have already become problems in Arctic and sub-Arctic areas (IPCC 2002).

A permanent road connecting potential development sites in the Planning Area to Nuiqsut would pass through important subsistence resource habitat and important subsistence-harvest areas for caribou, fish, wolves, wolverine, and birds. A road, combined with any development pipelines, would disrupt and displace caribou along its length and potentially disrupt hunting patterns by producing major alterations in hunter access patterns in both summer and winter. Any road access would represent a major artery where only trails had existed before. A road would promote the development and expansion of the oil patch, bringing with it similar issues about hunter access restrictions, hunting area reductions, trespass issues, disturbance and displacement of game, and the effectiveness of mitigation—all persistent and unresolved concerns from ongoing expansion at Prudhoe Bay, Kuparuk, and Alpine oil fields. The Dalton Highway, paralleling much of the Arctic portion of the Trans-Alaska Pipeline, has provided human access into remote regions and increased hunting and off-road vehicle impacts and accompanying impacts on caribou (Bergerud et al. 1984; NRC 2003).

A 1997 study on the proposed Eureka to Rampart road assessed impacts to subsistence resources and activities by non-local residents as a result of increased access from existing road projects. Effects identified in the study communities of Rampart, Stephens Village, Tanana, Eureka, Minto, and Manley Hot Springs included: 1) increased non-local hunter use as a result of local access using the Dalton Highway; 2) increased non-local pressure on the hunting of moose, bear, and waterfowl, fishing for salmon, pike, whitefish, and blackfish, and trapping; 3) increased noise activity from non-local hunter boat use; 4) increased minerals development; 5) state land disposals increasing home site developments and increased populations of potential subsistence users; 6) loss of habitat for subsistence resources and loss of lands used for subsistence harvests; 7) declines in moose populations; and 8) illegal use of Native lands by non-local users. As a result of this increased non-local access and hunting pressure, many local hunters curtailed their fall moose hunt and often waited until the winter season to hunt. Similar hunting, access, and habitat pressures on subsistence resources and harvest activities could be expected from potential State of Alaska or National Petroleum Reserve – Alaska road development on the North Slope.

In general, fish, birds, and caribou and other terrestrial mammals would be expected to experience greater and more continuous disturbance, mortality from vehicle collisions, and contamination effects from a road, with those nearest the road experiencing the greatest local disturbance and displacement. In the absence of restrictive regulations, local non-oil and gas related activities, including inevitable non-subsistence hunting (and the eventual pressure for increased sport hunting), would be expected to have effects on subsistence resource populations and subsistence harvest patterns, as competition between local and non-local users and subsistence and sport hunters would increase.

The combination of the 18-mile road to Nuiqsut, and a 75-mile road into the Planning Area, would produce more regional (and thus more profound) effects on the habitat and movement of subsistence resources, and on hunter access. Bridging the many productive rivers from Nuiqsut west would make these watercourses more vulnerable to siltation and fuel-spill contamination. Of primary concern would be: 1) the lack of any reliable process for assessing and monitoring changes to subsistence harvest patterns; 2) changes to hunter access; and 3) enforcement of the regulations that would already have been enacted to mitigate the profound and widespread effects such an artery would bring with it (Haynes and Pedersen 1989).

4.12.3.13 Sociocultural Systems

The presence of a road connecting portions of the Planning Area with Nuiqsut with the Kuparuk River Unit Spine Road would alter traditional Iñupiat subsistence culture. Disruptions would ripple through the sociocultural fabric, and existing institutions would be further harmed in responding to this development.

Subsistence resources could experience long-term disturbance and displacement effects that could potentially lead to reductions in resource populations, which in turn could result in increased hunter stress and a decreased sense of well-being. Even without subsistence resource population reductions, seasonal movements of caribou and other wildlife could change, causing hunters to alter traditional harvest practices by traveling to unfamiliar areas. Increased competition with outside hunters would increase existing user conflicts and could cause interethnic tensions in communities. Increased access to the community of Nuiqsut could increase the availability of drugs and alcohol, making them more affordable to those who might have avoided them because of their cost. Road access to the haul road could shift the focus of connection for Nuiqsut from Barrow to Fairbanks, as more residents would be encouraged to drive to Fairbanks for lower cost supplies and fuel. Some residents could leave the community for prolonged amounts of time, returning via the road to visit and reside in Fairbanks or other road-connected communities. Over the long term, such alterations could cause displacement of ongoing social systems and community activities by disrupting traditional practices for harvesting, sharing, and processing subsistence resources.

4.12.3.14 Environmental Justice

Alaska Iñupiat Natives, a recognized minority, are the predominant residents of the NSB—the area potentially most affected by the presence of a road within the Planning Area. Iñupiat Natives could be affected by the road because of their reliance on subsistence foods. A permanent road could impact subsistence resources and harvest practices. Potential effects would focus on the Iñupiat community of Nuiqsut, which would be the likely focal point of a either an internal or an external road because of its location.

Subsistence resources could experience long-term disturbance and displacement effects, as well as potential population reductions, causing subsistence hunters to alter traditional harvest practices by having to travel to unfamiliar areas. If these affects to subsistence resources were to occur, long-term displacement of ongoing sociocultural systems would be expected. Community activities and traditional practices for harvesting, sharing, and processing subsistence resources would be altered, and disproportionate effects would be expected for the Iñupiat communities.

4.12.3.15 Coastal Zone Management

The habitat, subsistence, and water-quality standards of the ACMP and the related enforceable policies of the NSB address the main areas of concern to North Slope residents. Subsistence uses of the coastal resources have been, and will continue to be of the highest priority for North Slope residents. The route of a permanent road connecting potential development sites in the northern Planning Area to Nuiqsut could pass through important habitat and important subsistence-harvest areas for caribou, fish, and birds. Activities related to road construction and the presence of a permanent road in or adjacent to coastal areas (including river crossings) would be subject to review under the ACMP. The inland coastal boundary of the NSB includes the zones of direct interaction and direct influence and extends inland approximately 25 miles. For the mid-Beaufort region, the inland coastal boundary includes certain river corridors (notably the Colville River corridor) to protect anadromous fish spawning and overwintering habitats.

If construction activities or the location of the road were likely to affect any land or water use or natural resource of the coastal zone, a review under the ACMP would be necessary. If a specific proposal were presented for review and approval, a site-specific analysis would determine whether an ACMP review were necessary and if so, which standards and enforceable policies would be applicable.

The most obvious ACMP standards that might need to be addressed are:

- Coastal Development;
- Utility Routes and Facilities;
- Sand and Gravel Extraction;
- Subsistence;
- Transportation Routes and Facilities;
- Habitats;
- Air, Land, and Water Quality; and
- Historic, Prehistoric, and Archeological Resources.

The National Petroleum Reserve – Alaska federal lands are excluded from the coastal zone. However, the CZMA requires that federal applicants proposing activities that have reasonably foreseeable effects on any coastal use or resource include, as part of their application, a certification that activities would be conducted consistent with the state's coastal management program, including the enforceable policies of the NSB CMP. If a project is located in the coastal zone and requires a federal authorization that is on the ACMP list of federal authorizations requiring

review, a review would be required (15 CFR § 930.53(a)(1)). The State of Alaska may concur with or object to an applicant's certification. At the time that future site-specific plans are submitted for any activities that have reasonably foreseeable effects on any coastal use or resource of the coastal zone, the applicant would be required to submit a consistency certification to the State of Alaska.

4.12.3.16 Recreation Resources

Impacts from a permanent road within the Planning Area would have minor effects on recreation. Primitive recreation opportunities would be impacted in the immediate vicinity of the road but, as explained in the Visual Resource section, beyond a distance of ½-mile from the road, those impacts would be minimal. Sight-seeing and other road-related recreation pursuits could benefit from the road. However, if the road were to be closed to the public, as currently proposed, at least for the near term, these benefits would not be available to the public. The area from the road to a distance of approximately ½ mile away from the road would be classified as Roaded Natural (RN) under the BLM's Recreation Opportunity Spectrum (ROS) system. The rest of the Planning Area would remain classified as Semi-Primitive Motorized (SPM).

Wilderness values would be most impacted within ½ mile of the road, and, as the road would be a permanent feature, impacts would be long term. Approximately 59,892 acres (644 acres/mile x [75 + 18] miles) would be impacted, and the wilderness values of naturalness, solitude, and opportunity for a primitive and unconfined recreation experience over that area would be impacted. Additional acres would be impacted from construction of an 18-mile road between the Kuparuk River Unit and Nuiqsut, although not all acres would have wilderness values due to their proximity to existing developments.

An east-west road connecting the Planning Area to Kuparuk would result in additional impacts to both the recreational and wilderness values of the area. Raised bridges, mineral material extraction areas, and other man-made features would all contribute to the impacts on primitive recreation experiences and the naturalness of the area. If the portion of the new permanent road to the National Petroleum Reserve – Alaska would be closed to the public, it would offer no new opportunities for recreational endeavors; the road would directly affect the natural resources of the area (described in previous sections), but not public use. There would be long-term loss of the wilderness values of naturalness, solitude, and primitive and unconfined recreation near the road. If the new road were opened to the public at some future time, there would be public recreational benefits from improved access, likely at lower cost than is currently available via aircraft. Nevertheless, with no permanent public roads within the Planning Area, most of the Planning Area would remain remote and difficult to access.

A road could possibly impact outstandingly remarkable values, free-flow, and water quality on the Colville River, which was found to be eligible, though not currently "suitable," for designation as a Wild and Scenic River. The most likely effects would be approximately 3 miles upstream (south) from Nuiqsut where the road would cross the Colville River. A permanent bridge crossing at this location would slightly reduce the 97-mile length of the eligible river segment from Umiat to Nuiqsut, which is primarily considered eligible because of paleontological and wildlife resources. Such impacts would not change the determination that, although eligible, the Colville River is not currently considered suitable for designation as a Wild and Scenic River.

4.12.3.17 Visual Resources

Impacts to visual resources from a permanent road within the Planning Area would be greatest within a half-mile radius of the road. The gravel road would be raised above the surrounding terrain, and bridges would be needed to cross major rivers, both of which would contribute to the visibility of the road and the reduction of naturalness of the area. The road would impact approximately 644 acres/mi, or 59,892 acres total (644 acres/ mile x [75 + 18] miles), over the length of the road, and would result in the long-term loss of visual resources.

An east-west road connecting the Planning Area to Kuparuk would result in additional impacts to visual resources. Potential impacts would include the raised road, any bridges needed to cross water bodies, and material sites used

for gravel extraction. These features would reduce the naturalness of the area and would result in the long-term loss of visual resources.

4.12.3.18 Economy

As of October 2004, the Industrial Roads Program adopted by Alaska Department of Transportation Public Facilities has envisioned development of the Colville River Road and a Colville River Bridge to facilitate and encourage resource development. According to the ADOTPF web page (http://www.dot.state.ak.us/), it is thought that this project would be likely to stimulate oil development in National Petroleum Reserve – Alaska and provide benefits to the Alaskan workers, the oil industry, the state, and the country. While the route would present security and management challenges, it would offer lower capital/operating costs to the state and would have a lower environmental impact to the region than the other alternatives (CH2M HILL 2003). The ADOTPF had planned to conduct all necessary material site exploration, hydrological surveys and environmental analyses during 2005, and construction was expected to be completed by 2009; however, the project is currently on hold while the ADOTPF reviews other potential transportation routes to the area. Economic theory suggests that savings to industry would encourage exploration and development of fields that they would not otherwise be considered. A bridge over the Colville River would allow industry to begin exploration earlier in the season than construction of an ice bridge and to bring discovery into production sooner (CH2M HILL 2003).

CHAPTER 5

CONSULTATION AND COORDINATION

TABLE OF CONTENTS

Page

5.1 Preview of this Section 5-3
5.2 Formal Scoping 5-3
5.3 Agency and Organization Meetings 5-3
5.4 Agencies and Organizations Contacted 5-4
5.5 Government-to-Government Consultation 5-5
5.6 Public Review and Comment on the Draft Amended IAP/EIS 5-7
5.7 Development of the Final Preferred Alternative 5-7
5.8 List of Preparers of the Amended IAP/EIS 5-8

CHAPTER 5

CONSULTATION AND COORDINATION

5.1 Preview of this Section

This section summarizes the scoping process conducted for the preparation of the Draft Amended IAP/EIS. It also summarizes the public review and comment process on the Draft Amended IAP/EIS. Summaries of the agency and organization meetings, agencies and organizations contacted, Government-to-Government consultation, and summary of the development of the BLM's final Preferred Alternative are provided. The individual preparers, with their areas of expertise and/or responsibility, are also listed.

5.2 Formal Scoping

The BLM published a Federal Register Notice of Intent to Plan (Notice), and a Call for Nominations and Comments (Call), on June 23, 2003. The Notice and Call asked the public to help the BLM identify issues and resources relevant to planning and potential oil and gas leasing. The BLM also asked oil companies to identify their areas of interest within the Planning Area. The Notice and Call stated that the period during which comments would be taken on the proposal would be from June 23 through September 30, 2003. On September 15, 2003, the BLM published a Notice of Extension that extended the period for accepting scoping comments until October 31, 2003. Comments on the proposal could be submitted in writing to the BLM Project Manager or via an interactive website (http://nenpra.ensr.com).

Public notices announcing the scoping period were placed in newspapers in or near locations where public meetings were held. These newspapers included the Anchorage Daily News (October 5 and 7, 2003), the Fairbanks Daily News Miner (October 5 and 8, 2003), and the Arctic Sounder (October 9, 16, and 23, 2003).

Six public scoping meetings were held throughout Alaska between October 7 and November 13, 2003. Meetings (and dates) were as follows: Anchorage (October 7), Fairbanks (October 8), Nuiqsut (October 15), Barrow (October 16), Anaktuvuk Pass (October 28), and Atqasuk (November 13). The scoping meetings were conducted in an open-house style. Informational displays were set up, and a formal presentation was given to provide the public with additional information on program goals and objectives. The formal presentation was followed by a public comment session. Written and oral comments were accepted at these meetings, and a court reporter prepared a transcript of the oral comments. A translator was also provided for the public meetings in Atqasuk, Anaktuvuk Pass, Barrow, and Nuiqsut.

In addition, informal public meetings were held in 2004 in Nuiqsut (January 19) and Barrow (January 26) to describe the proposed alternatives and stipulations.

5.3 Agency and Organization Meetings

The BLM conducted a two-day workshop in Anchorage, on December 3-4, 2003, to describe and develop stipulations for use in the Northeast National Petroleum Reserve – Alaska. Attendees included representatives from federal, state, and local agencies, and representatives from the village of Nuiqsut. In addition, the BLM has held ongoing discussions with numerous federal, state, and local agencies and organizations.

5.4 Agencies and Organizations Contacted

The following agencies and organizations were contacted during the planning process:

- **Federal Agencies**
  Minerals Management Service
  National Oceanic and Atmospheric Administration Fisheries Service
  National Park Service
  U.S. Army Corps of Engineers
  U.S. Department of Energy
  U.S. Environmental Protection Agency
  U.S. Fish and Wildlife Service
  U.S. Geological Survey

- **State of Alaska Agencies**
  Department of Fish and Game
  Department of Natural Resources

- **Municipal Governments**
  City of Anaktuvuk Pass
  City of Anchorage
  City of Atqasuk
  City of Barrow
  City of Bethel
  City of Fairbanks
  City of Kaktovik
  City of Nuiqsut
  City of Point Hope
  City of Wainwright
  Native Village of Point Lay
  North Slope Borough

The following is a partial list of organizations and officials who were notified that the Final Amended IAP/EIS was available for review and comment (for a complete mailing list, contact: Bureau of Land Management, Office of External Affairs (912), 222 West 7th Avenue, Anchorage, Alaska 99513):

- **Organizations**
  Arctic Slope Regional Corporation
  Alaska Center for the Environment
  Alaska Coalition
  Alaska Conservation Foundation
  Alaska Eskimo Whaling Commission
  Alaska Miners Association
  Alaska Oil and Gas Association
  Alaska Outdoor Council
  Alaska Wildlife Alliance
  Alyeska Pipeline Service Company
  Anadarko Petroleum Corporation
  ARCO Alaska
  Arctic Resource Commission
  Arctic Slope Native Commission
  Arctic Slope Regional Corporation

Barrow Whaling Captains Association
BP Exploration (Alaska), Inc.
Bristol Bay Native Corporation
Center for Biological Diversity
Chevron USA
ConocoPhillips Alaska Inc.
Defenders of Wildlife
Ducks Unlimited Inc.
Evergreen Resources of Alaska
Exxon
Forest Oil Corporation
Japan National Oil Corporation
Kuukpik Corporation
Marathon Oil Company
National Audubon Society
Natural Resource Defense Council
Northern Alaska Environmental Center
Resource Development Council
Sierra Club
Sun-West Oil and Gas Incorporated
The Nature Conservancy
Total E&P USA, Inc.
Trading Bay energy Corporation
Ukpeagvik Iñupiat Corporation
Unocal Oil and Gas Division
Union Texas Petroleum Company
Wilderness Society
Wildlife Management Institute
World Wildlife Fund

- **Elected Officials**
  Governor of Alaska Frank Murkowski
  U.S. Senator Ted Stevens
  U.S. Senator Lisa Murkowski
  U.S. Representative Don Young
  Alaska State Senators
  Alaska State Representatives

5.5 Government-to-Government Consultation

Federally recognized tribes have a unique legal and political relationship with the government of the United States, as defined by the U.S. Constitution, treaties, statutes, court decisions, and executive orders. These definitive authorities also serve as the basis for the federal government's obligation to acknowledge the status of federally recognized Tribes in Alaska.

The BLM consults with federally recognized tribes, consistent with the Presidential Executive Memorandum dated April 29, 1994, on Government-to-Government Relations with Native American Tribal Governments; Executive Order 13175 dated November 6, 2000, on Consultation and Coordination with Indian Tribal Governments; and the January 18, 2001, Department of the Interior – Alaska Policy on Government-to-Government Relations with Alaska Native Tribes. The BLM formally consults with federally recognized tribes in Alaska before taking action or undertaking activities that will have a substantial, direct effect on federally recognized tribes, or their assets, rights, services, or programs. To this end, formal Government-to-Government consultation with the following

federally recognized traditional governments was initiated by written correspondence on August 27, 2003, prior to scoping for the amendment:

- Native Village of Anaktuvuk Pass
- Native Village of Atqasuk
- Native Village of Barrow
- Native Village of Nuiqsut
- Iñupiat Community of the Arctic Slope

The letter sent to all of the tribal governments described the proposed action, and invited the tribes to call if they had questions or wanted to set up individual meetings with the Authorized Officer of the BLM Northern Field Office. The letter also invited the tribal councils to attend the scoping meeting scheduled for their community. All tribal governments were called approximately two weeks after the letters were sent, in order to solicit questions or potential concerns, and to make sure that the information in the letter was received and understood.

In addition, the BLM participated in a number of meetings with federally recognized tribes and state and local governments in which the topic of the amendment was on the agenda. These meetings, which are listed below, include BLM Subsistence Advisory Panel Meetings, where each panel member is a representative of either a tribal or local government, as well as meetings with the NSB and the local communities of Nuiqsut and Barrow.

- Native Village of Nuiqsut Tribal Council, October 15, 2003 in Nuiqsut, Alaska
- Subsistence Advisory Panel, November 3, 2003 in Atqasuk, Alaska
- Native Village of Atqasuk, November 4, 2003 in Atqasuk, Alaska
- Native Village of Nuiqsut Tribal Council, Kuukpik Subsistence Oversight Panel, and the City of Nuiqsut, December 3-4, 2003 in Anchorage, Alaska
- Subsistence Advisory Panel, December 11, 2003 in Barrow, Alaska
- Kuukpik Subsistence Oversight Panel, January 19, 2004 in Nuiqsut, Alaska
- Native Village of Nuiqsut Tribal Council, January 20, 2004 in Nuiqsut, Alaska
- North Slope Borough, City of Barrow, and Native Village of Barrow, January 26, 2004 in Barrow, Alaska
- Subsistence Advisory Panel, March 16, 2004 in Nuiqsut, Alaska
- Kuukpik Subsistence Oversight Panel, March 18, 2004 in Nuiqsut, Alaska
- Subsistence Advisory Panel, June 10, 2004 in Barrow, Alaska
- Subsistence Advisory Panel, November 9, 2004 in Nuiqsut, Alaska

Comments and issues brought forward through consultation with Native tribal governments focused on the following topics: 1) the purpose and need for amending the 1998 Northeast IAP/EIS; 2) protection of subsistence resources; 3) anticipated levels of oil and gas and related activities (including seismic exploration) as a result of leasing new areas; 4) development of roads to villages and bridges across rivers and streams; 5) retaining the stipulations as they currently exist in the 1998 Northeast IAP/EIS ROD; 6) use of traditional knowledge in making decisions; and 7) local employment opportunities.

During consultation, tribal leaders made a few specific recommendations. These recommendations included making stipulations and ROPS more restrictive; protecting subsistence use areas and resources; limiting restrictions on access to subsistence areas near oil developments; making core calving areas and insect-relief areas for the Teshekpuk Lake caribou herd unavailable for leasing; protecting the primary migration route of the Teshekpuk Lake caribou herd, which is located between the eastern shore of Teshekpuk Lake and the coast; protecting goose molting areas; restricting shipping traffic in areas used by bowhead whales; protecting cabins and camps; seeking ways to increase employment opportunities with oil companies on the North Slope; and adequately addressing the health and social impacts of oil and gas leasing on the residents of the North Slope. All comments and recommendations were received verbally during meetings with individual tribal councils.

5.6 Public Review and Comment on the Draft Amended IAP/EIS

The Notice of Availability (NOA) of the Draft Amendment to the Northeast National Petroleum Reserve-Alaska Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) and the Announcement of Public Subsistence-Related Hearings Schedule was published in the Federal Register on June 9, 2004. The public comment period was originally scheduled from June 9, 2004, through August 8, 2004, however, it was extended through August 23, 2004. Public notices announcing the comment period were placed in newspapers with circulation in or near locations where public meetings were held. These newspapers included the Arctic Sounder (August 8 and 15, and October 28, 2004) and Tundra Drums (August 12 and November 11, 2004). Public service announcements were broadcasted on radio station KBRW from July 27 through August 17, and during late October through November 2004. The BLM issued a press release on June 9, 2004, notifying the public that the Draft Amended IAP/EIS was available for public review, and the schedule for public comment and ANILCA 810 subsistence hearings. Notices were posted at public gathering places in Nuiqsut, Barrow, Anaktuvuk Pass, and Atqasuk, all located on the North Slope of Alaska, and Bethel, Alaska, located on the Yukon Delta. Information on the Draft Amended IAP/EIS was also posted on the interactive website (http://nenpra.ensr.com). The public was able to access the website to download a copy of the Draft Amended IAP/EIS and provide their comments (including attachments). Comments and attachments posted to the website were incorporated into a database for later analysis by the core planning team.

Public and subsistence hearings were held in Anchorage on June 28, Fairbanks on June 29, Washington D.C. on July 1, Anaktuvuk Pass on August 3 and November 8, Nuiqsut on August 9 and December 1, Atqasuk on August 10 and November 4, Barrow on August 12 and November 5, and Bethel on August 17 and November 11, for the BLM to provide an overview of the alternatives and to take public comments and subsistence testimony. Over 214,660 comments were received on the Draft Amended IAP/EIS. These included letters, electronic mail, facsimiles, comments and attachments posted to the project website, and comments provided at the public hearings. A summary of the comments received and specific comments and responses are presented in Volume II, Chapter 6, of this Final Amended IAP/EIS. All comment letters are reproduced on the CD located in the back pocket of Volume I.

5.7 Development of the Final Preferred Alternative

After completion of the public hearings and closure of the public comment period, the core planning team, resource staff, and management met to review the comments and alternative proposals and to develop the BLM's final Preferred Alternative. Several alternative proposals were received. These included proposals to close or open additional areas to leasing and development; place greater or lesser restrictions on the types of activities allowed under stipulations and ROPs; and combine elements of two or more alternatives (e.g., select Alternative A, but replace the 1998 stipulations with stipulations and ROPs developed for Alternative B).

During the comment period on the Draft Amended IAP/EIS, the USFWS submitted a proposal that would leave approximately 296,000 acres northeast of Teshekpuk Lake unavailable to oil and gas leasing. The full text of the agency's letter can be read on the CD included with this document (see Comment Number 197619; U.S. Fish and Wildlife Service at Anchorage). This is an increase of 83,000 and 85,000 acres that would be made unavailable for leasing as compared to Alternative B (Preferred Alternative in Draft Amended IAP/EIS; 213,000 acres unavailable for leasing; Map 2-2), and the final Preferred Alternative (Alternative D; 211,000 acres in Teshekpuk Lake unavailable for leasing; Map 2-4), respectively. The USFWS believes their proposal would provide additional protection for molting brant and other wildlife.

An alternative proposal was also submitted by ConocoPhillips Alaska, Inc. The full text of the company's letter can be read on the CD included with this document (see Comment numbers 196557 and 197611; ConocoPhillips Alaska, Inc.). Their proposal would allow for oil and gas leasing, exploration, and development within portions of

the area closed to leasing under Alternative B. ConocoPhillips believes that their proposal would provide adequate protection for caribou and molting geese, while providing additional lands for oil and gas development.

The BLM took these proposals and other public comments into consideration when reviewing the alternatives developed for the Draft Amended IAP/EIS. Based on these comments, the BLM developed a final Preferred Alternative for the Final Amended IAP/EIS. This alternative allows for some oil and gas development in the 213,000-acre no-lease area identified under Alternative B (Map 2-4). However, this alternative also provides protection for geese, caribou, subsistence, and other resources found to the north and east of Teshekpuk Lake, by prohibiting permanent oil and gas facilities (excluding pipelines and roads in some areas) on 374,000 acres (Alternative B protects 213,000 acres), and limiting the amount of development (maximum of 300 acres) that can occur within each of seven lease tracts to the north of the lake (Map 2-4). This alternative also defers leasing of Teshekpuk Lake (211,000 acres). With the development of the final Preferred Alternative, the BLM feels it has developed a range of alternatives that encompasses the range of alternatives submitted by the public and agencies.

5.8 List of Preparers of the Amended IAP/EIS

The following specialists (and company/agency and area of specialty) are indicated in parentheses. Companies include ENSR International (ENSR); Booz, Allen, and Hamilton (BAH); LGL Alaska Research Associates, Inc. (LGL); Northern Economics, Inc. (NEI); Planera, Inc. (Planera), and Stephen R. Braund and Associates, Inc. (SRBA). Bureau of Land Management offices include the Anchorage Field Office (AFO), Alaska State Office (ASO), and Northern Field Office (NFO). The MMS is located in Anchorage, Alaska.

- Anderson, Kimberly (ENSR; Technical Writer)
- Armstrong, Gary (BAH; Alternatives Development Specialist)
- Baldivieso, Alan (SRBA; GIS Specialist)
- Banet, Art (BLM-ASO; Coal Resources and Seismic)
- Berg, William (ENSR; Geology and Oil and Gas Exploration and Development)
- Berry, Robert (ENSR; Water Resources)
- Bibles, Dean (BAH; IAP/NEPA Advisor)
- Bisson, Henri (ASO; BLM State Director)
- Braund, Stephen (SRBA; Cultural Resources and Subsistence)
- Brelsford, Taylor (BLM-ASO; Sociocultural Economist)
- Brumbaugh, Rob (BLM-ASO; Physiography)
- Burden, Patrick (NEI; Economics)
- Childs, Susan (BLM-ASO; BLM Project Manager)
- Craig, Jim (MMS; Petroleum Geology, Oil and Gas Assessment, and Oil and Gas Exploration and Development Activities)
- Cuyno, Leah (NEI; Economics)
- Delaney, Roger (BLM-NFO; Recreation and Wilderness Resources)
- Dougherty, Sean (BAH; GIS Specialist)
- Ellsworth, Steven (ENSR; Assistant Project Manager)
- Erickson, Ara (ENSR; Editor and Document Production)
- Fechhelm, Robert (LGL; Fisheries)
- Flaming, Barry (ENSR; Soil, Sand, and Gravel)
- Flora, Susan (BLM-NFO; Hazardous Materials)
- Funk, Dale (LGL; Vegetation and Wetlands and Floodplains)
- Gilders, Michelle (LGL; Terrestrial Mammals)
- Goodwin, Randy (BLM-NFO; Off Highway Vehicles and Recreation)
- Grover, Elizabeth (SRBA; Section 106 Consultation and Subsistence)
- Hammond, Tim (BLM-NFO; GIS Specialist)
- Haskell, Sean (LGL; Caribou Biology)

- Hilsinger, Erik (SRBA; Traditional Knowledge and Subsistence)
- Huebner, Darek (BLM-NFO; Soils, Gravel, and Physiography)
- Kasterin, Mike (BLM-ASO; Socioeconomics)
- Kemnitz, Richard (BLM-NFO; Water Resources)
- Kelly, Lon (BLM-ASO; Recreation)
- King, Robert (BLM-NFO; Cultural Resources and Paleontological Resources)
- Kirschbaum, Sara (BAH; GIS Specialist)
- Kleven, Mike (BLM-NFO; Northern Field Office Environmental Planning Coordinator)
- Kosnik, Kristine (BLM-NFO; GIS Specialist)
- Koss, Lee (BLM-ASO; Air Quality and Soils)
- Kunz, Michael (BLM-NFO; Cultural Resources and Paleontological Resources)
- Long, Alissa (ENSR; Wetlands)
- McCaa, Craig (BLM-NFO; Public Affairs Specialist)
- McClain, Holli (BLM-NFO; Visual Resources)
- McIntosh, Stacie (BLM-NFO; Cultural Resources, Subsistance, and ANILCA 810 Analysis)
- Meares, Don (BLM-NFO; Physiography, Sand and Gravel, Oil and Gas Exploration-Environmental Status)
- Mundy, Nancy (NEI; Economics)
- Munson, Kim (ENSR; Paleontology)
- Nigro, Debbie (BLM-NFO; Avian Species and Threatened and Endangered Species)
- Nordmann, Jerry (BLM-NFO; Lands/Realty)
- Paulson, Merlyn (ENSR; Visual Resources)
- Paulus, Stuart (ENSR; Project Manager)
- Payne, John (BLM-ASO; Threatened and Endangered Species)
- Randall, Valerie (ENSR; NEPA Specialist)
- Rodrigues, Robert (LGL; Avian Biology Specialist)
- Scheetz, Vince (ENSR; Air Quality)
- Schneider, Robert (BLM-NFO; NFO Director)
- Servoss, Shawn (BLM-NFO; GIS Specialist)
- Sharpe, Margaret (ENSR; Editor)
- Strom, Bernhard (Planera; Realty, Land Use, Transportation, and Recreation)
- Thomas, Jane (ENSR; Petroleum Engineering and Spills and Hazardous Materials)
- Tol, Dennis (BLM-ASO; Fisheries)
- Whitman, Mathew (BLM-NFO; Fisheries)
- Williams, Michael (LGL; Marine Mammals)
- Wilson, Curt (BLM-ASO; Chief Planner/Environmental Coordinator)
- Wolf, Janet (ENSR; Public Participation)
- Worley, Mike (BLM-NFO; Lands/Realty)
- Worthey, Marshall (BAH; GIS Specialist Public Lands)
- Yokel, Dave (BLM-NFO; Terrestrial Mammals and Vegetation)

CHAPTER 6
COMMENTS AND RESPONSES

TABLE OF CONTENTS

Page

6.1 Summary of Comments on the Draft Amended IAP/EIS 6-3
6.2 Commenting Agencies, Organizations, and Individuals 6-4
6.2.1 Written Comments 6-4
6.2.2 Public Subsistence-Related Meeting Testimony 6-6
6.2.2.1 Public Subsistence-Related Meetings and ANILCA 810 Hearings on the Draft Amended IAP/EIS 6-6
6.3 General Comments and Responses 6-10
6.4 Specific Comments and Responses 6-12
TOPIC: AIR QUALITY 6-13
TOPIC: ALTERNATIVES, RANGE OF ALTERNATIVES, PREFERRED ALTERNATIVES 6-14
TOPIC: ANILCA 6-44
TOPIC: BASIC ASSUMPTIONS 6-52
TOPIC: BIRDS 6-72
TOPIC: CABINS AND CAMPS 6-121
TOPIC: CARIBOU 6-123
TOPIC: COASTAL ZONE MANAGEMENT 6-148
TOPIC: CONSULTATION WITH FEDERAL AGENCIES 6-149
TOPIC: CULTURAL RESOURCES 6-151
TOPIC: CUMULATIVE IMPACTS AND ANALYSES 6-152
TOPIC: DEVELOPMENT FIELD LAYOUT 6-166
TOPIC: ECONOMY 6-167
TOPIC: EDITS 6-169
TOPIC: EFFECTS OF SPILLS 6-174
TOPIC: ENVIRONMENTAL JUSTICE 6-179
TOPIC: FISH 6-182
TOPIC: FISH 6-185
TOPIC: GENERAL COMMENTS AND PROCESS 6-186
TOPIC: GEOLOGY 6-196
TOPIC: GLOBAL CLIMATE CHANGE 6-198
TOPIC: GOVERNMENT TO GOVERNMENT 6-202
TOPIC: GRAVEL, GRAVEL MINES, GRAVEL MINE RECLAMATION 6-203
TOPIC: HAZARDOUS MATERIALS AND WASTE 6-205
TOPIC: IMPACT COMPENSATION 6-206
TOPIC: IMPACT EVALUATION 6-206
TOPIC: INFRASTRUCTURE 6-214
TOPIC: JURISDICTIONAL ISSUES 6-215
TOPIC: LAND EXCHANGE 6-215
TOPIC: LAND OWNERSHIP AND USES 6-216
TOPIC: LEGAL 6-216
TOPIC: MARINE MAMMALS 6-219
TOPIC: MINING 6-229
TOPIC: MONITORING FOR COMPLIANCE 6-230
TOPIC: NEPA PROCESS 6-234
TOPIC: OIL FIELD DEVELOPMENT 6-242
TOPIC: OIL RESOURCES 6-242
TOPIC: OIL SPILL RESPONSE 6-243
TOPIC: OIL SPILL SCENARIOS 6-244
TOPIC: OUTSIDE SCOPE OF IAP/EIS 6-244
TOPIC: PERMITTING AND REQUIRED PERMITS 6-245

TOPIC: PIPELINES AND PIPELINE CONSTRUCTION....6-245
TOPIC: PLANNING....6-247
TOPIC: PREFERENCE AND OPINION....6-256
TOPIC: PRODUCTION PADS....6-257
TOPIC: PURPOSE AND NEED....6-258
TOPIC: PURPOSE OF NPR-A....6-267
TOPIC: RESEARCH AND MONITORING TEAM....6-267
TOPIC: RIGHT OF WAY....6-269
TOPIC: ROADLESS AREAS AND DEVELOPMENT....6-270
TOPIC: ROADS....6-272
TOPIC: SEASONAL ROADS AND DRILLING PADS....6-274
TOPIC: SEISMIC SURVEYS....6-274
TOPIC: SITE CLEARANCE AND REQUIREMENTS FOR ABANDONMENT AND RESTORATION....6-277
TOPIC: SOCIOCULTURAL SYSTEMS....6-279
TOPIC: SOILS AND PERMAFROST....6-286
TOPIC: SPECIAL DESIGNATION AREAS....6-287
TOPIC: SPILL PREVENTION AND RESPONSE....6-297
TOPIC: STIPULATIONS AND ROPS....6-298
TOPIC: STUDIES....6-361
TOPIC: SUBSISTENCE....6-361
TOPIC: TERRESTRIAL MAMMALS....6-372
TOPIC: TESHEKPUK LAKE....6-373
TOPIC: THREATENED AND ENDANGERED SPECIES....6-375
TOPIC: TIMING....6-381
TOPIC: TRADITIONAL KNOWLEDGE....6-383
TOPIC: TRAFFIC: AIRCRAFT, WATERCRAFT, PEDESTRIAN....6-383
TOPIC: TRANSPORTATION....6-388
TOPIC: TUNDRA TRAVEL....6-388
TOPIC: VEGETATION....6-390
TOPIC: VISUAL RESOURCES....6-391
TOPIC: WATER DEMAND....6-392
TOPIC: WATER RESOURCES....6-394
TOPIC: WATER WITHDRAWAL....6-395
TOPIC: WELL DRILLING....6-397
TOPIC: WETLANDS....6-399
TOPIC: WILD AND SCENIC RIVERS....6-400
TOPIC: WILDERNESS AREAS....6-402
TOPIC: WILDLIFE AND ECOLOGY....6-403

CHAPTER 6

COMMENTS AND RESPONSES

This section provides a summary of the comments received on the Draft Amended IAP/EIS. A list of the agencies, organizations and individuals who submitted substantive comments is provided. Finally, both general and specific comments and the BLM's responses to those comments are presented.

6.1 Summary of Comments on the Draft Amended IAP/EIS

Approximately 214,665 individual comments on the Draft Amended IAP/EIS were received during the public comment period from June 9 through August 23, 2004. Comments on the Draft Amended IAP/EIS were received via letter, electronic mail (email), facsimile (fax), the project website (http://nenpra.ensr.com), and formal public meetings. Comments were received from many states of the United States, Canada, and Europe.

Approximately 212,860 comments were received in response to solicitations from advocacy groups, and many of these were identical statements or slight variations thereof. Each of the form letters was read and substantive issues were identified

Twelve public subsistence-related hearings were held during June, July, August, November, and December 2004. More than 129 people made statements. The meetings were held at Anaktuvuk Pass, Anchorage, Atqasuk, Barrow, Bethel, Fairbanks, and Nuiqsut, Alaska, and Washington, D.C. Comment letters and hearing transcripts were assigned tracking numbers and entered into a database. Individual tracking numbers were assigned to only one representative letter for identical or nearly identical form letters. All comments received on the draft document are included in the Administrative Record

The project interdisciplinary team reviewed all comment letters and hearing transcripts, and substantive comments (as defined in the BLM NEPA Handbook H-1790-1) requiring specific responses. A comment received a specific response if it 1) was substantive and related to inadequacies or inaccuracies in the analysis or methodologies used; and/or 2) identified new impacts or recommended reasonable new alternatives or mitigation measures; and/or 3) involved substantive disagreements on interpretation of significance. After all comment letters were reviewed, each substantive comment was assigned a comment issue code and letters were annotated to identify each coded substantive comment. The original and annotated letters have been entered into the Administrative Record.

Specific comments and responses are provided in Section 6.4. The text of the Final Amended IAP/EIS has been revised or edited where appropriate to address the comments. Much of the additional information, either requested or provided by public input, has been incorporated in the Final Amended IAP/EIS. Information on how specific comments were addressed and where they are addressed within the Final Amended IAP/EIS is detailed in the response to each issue statement in Section 6.4.

The approximately 214,665 comment letters received and the transcripts from the six public hearings, four ANILCA 810 subsistence hearings, and the public subsistence meeting in Bethel have not been reproduced in this document. The issue statements presented in Section 6.4 summarize the substantive and general comments received. Copies of all meeting transcripts, substantive comment letters, and representative letters received from advocacy groups are included in the CD-ROM located in the back pocket of Volume I of the Final Amended IAP/EIS. Information contained on the CD-ROM is also included on the project website (http://nenpra.ensr.com). The comment letters are part of the Administrative Record and can be inspected upon request to the BLM.

6.2 Commenting Agencies, Organizations, and Individuals

6.2.1 Written Comments

Written substantive comments were received from the agencies, organizations, and individuals listed below. The number following the name of the organization or individual(s) below is a discrete identification number that was used in the response to comments process. The specific comments and responses are presented in Section 6.4. Reproductions of representative letters, including each letter with a comment requiring a specific response, are provided in the CD-ROM located in the back pocket of Volume I of the Final Amended IAP/EIS. Information contained on the CD-ROM is also included on the project website (http://nenpra.ensr.com).

Federal Agencies

- U.S. Environmental Protection Agency (197632)
- U.S. Fish and Wildlife Service at Anchorage (197619)
- U.S. Fish and Wildlife Service at Fairbanks (197618)
- U.S. Geological Survey (196952)
- Representative John Dingell (196942)
- Representative Richard W. Pombo (197612)
- Representative Mark Udall (197613)

State and Local Governments and Tribal Organizations

- Governor Frank Murkowski and the State of Alaska (197620)
- Iñupiat Community of the Arctic Slope (197635)
- The North Slope Borough (197621)

Alaska Native Claims Settlement Acts Corporations

- Kuukpik Corporation (197616)

Oil and Gas Industry and Related Groups

- Alaska Oil and Gas Association (197608)
- Anadarko Petroleum Corporation (197615)
- ConocoPhillips Alaska, Inc. (196557, 197611)

Conservation Groups and Related Groups

- Alaska Coalition – Alaska Center for the Environment, Alaska Coalition, Alaska Wilderness League, Campaign for America's Wilderness, Center for Biological Diversity, Natural Resources Defense Council, Northern Alaska Environmental Center, Sierra Club, The Wilderness Society, U.S. PIRG, and World Wildlife Fund (197617)
- Alaska Eskimo Whaling Commission (197605)
- Alaska Miners Association, Inc. (196937)
- Arizona Wildlife Federation (193978)
- Audubon Alaska/National Wildlife Federation (197610)
- California Waterfowl Association (196939)
- Central Sierra Environmental Resource Center (196940)
- Ducks Unlimited (188338, 196943)
- Howard County Bird Club (182845)
- Juneau Audubon Society (195732)
- Northern Alaska Environmental Center (197614)
- Ornithologist's Coalition (197606)
- Pacific Flyway Council (196949)
- The Nature Conservancy (197609)
- The Wildlife Society (191279)
- Wildlife Conservation Society (196561)
- Wildlife Management Institute (194259)

Other Written Comments

- A. E. White (106114)
- Aaron Gilliam (086081)
- Aaron Wernham (195986)
- Ann Dyes (196944)
- Anna Jacus (183854)
- Arnie Schildhaus (196950)
- Arnold Brower Jr. (197986, 197988)
- Barbara Hoekenga (000119)
- Ben Long (196948)
- Brenda Wright (195732)
- Brian Moore (197977)
- Brodie Anderson (197976)
- Carl Wassilie (179814)
- Carol Wallace (87251)
- Catherine Greenleaf (196207)
- Charles Barnwell (193638)
- Charles Brower (197980)
- Charles Calvert (92812)
- Charles Smith (000040)
- Christian Timmerman (196988)
- Christiane Raymond (197631)
- Christine Bucklin (59528)
- Christine Kulis (197624)
- Claudia Greco (169388)
- C.S. Symington (157751)
- David Addison (135985)
- Dominique Banchelet (181423)
- Dora Nukapigak (197990)
- Doug Canady (149296)
- Edward Itta (197980)
- Elisabeth Lehigh (195360)
- Elizabeth McCloskey (196086)
- Frederick Tukle (197990)
- Geoff Carroll (197980, 197988)
- George Ahmaogak, May North Slope Borough (196407)
- Gerhard Olving (197630)
- Gwen Heisterkamp (161699, 168331)
- Harry Brower (197986)
- Isaac Nukapigak (197973)
- Jamie Palter (137486)
- Jane Fasullo (114822)
- Jean and Harold Kolb (197627)
- Jennifer van den Berg (195938)
- Jessica Longstreth (195560)
- Jim DiPeso (196404)
- Jim Thiele (194429)
- Joe Gutshall (191222)
- John Gardner (197977)
- John Kozub (122798)
- John Schoen (197975)
- John Strasenburgh (185987, 196951)
- John Swanson (197633)
- Joseph Eviklook (197973)
- Julian Powers (144995, 151054, 157741)
- June R. Huyett Thomas (195059)
- Karen Appleby (137605)
- Karen Fant (196945)
- Kate Stephenson (57320)
- Kathi Griffin (39278)
- Kay Woods (183937)
- Kevin Witt (195444)
- Kristin Cummings (197977)
- Kristi Espinoza (118849)
- Leonard Lampe (197973)
- Linda Muller (033401)
- Mark Ahmakak (197973)
- Mark Fiore (153527)
- Mark Tipperman (185012)
- Mary An McCall (197639)
- Mary Hogan (196947, 194604)
- Mary Johnston (197634)
- Michael Graesser (196946)
- Michael North (196264)
- Michael Piehl (196572)
- Myron P. Naneng, Sr. (197982, 197978)
- Nancy Ebbert (19869)
- Ned Egen (125270)
- P. Matthew Shudtz (197637)
- Patriotic U.S. Citizen (149424)
- Paul Hugo (197974)
- Paul Kriescher (051844)
- Peter Pennington (000037)
- Polly Dyer (196714)
- Raymond Wager (149036)
- Richard Rossiter (24226)
- Robert Davison (194259)
- Robert Edward, Sr. (197980)
- Robert Franz (197636)
- Robert Markeloff (197622)
- Ron Kim (197611)
- Rosemary Ahtuangaruak (197976, 197990)
- Ruth Sperling (196041)
- Santiago Miro (63180)
- Sarah McGiffert (187460, 192313)
- Sarah Ryker (59760)
- Sean O'Connor (144940)

- Sharon and Kenneth Wyberg (186677, 189912, 196953)
- Stan Senner (197978)
- Stephanie Danielson (184901)
- Steve Yates (121623)
- Steven DeCaluwe (138143)
- Steven Mueller (033673)
- Susanne Moser (197621)
- T.D. Kameron (92949)
- Taqulik Hepa (197988)
- Ted von Hippel (000039)
- Terry Cummings (196941)
- Thomas Itta (197979)
- Thomas Matthews (116072)
- Tom and Sally Overholt (197629)
- Tom Paragi (143335)
- Veronica Estelle (196456, 196457)
- Virginia Alden (196938)
- Wallace Elton (182141)
- Wayne T. Gilchrest (197984)

6.2.2 Public Subsistence-Related Meeting Testimony

Substantive comments received during the 12 public subsistence-related hearings have been addressed in the same manner as written comments. All of the following individuals spoke at the public meetings. The comments that received a written response have been assigned a discrete comment identification number located beside the name of the individual.

6.2.2.1 Public Subsistence-Related Meetings and ANILCA 810 Hearings on the Draft Amended IAP/EIS

Anaktuvuk Pass, Alaska **(Document Identification Number 197974).** The public subsistence-related hearing in Anaktuvuk Pass was held on August 3, 2004 in the Nunamiut School at 7 p.m. Approximately 22 people attended this hearing. The following attendees provided comments for the record:

- Anna Iona Hugo Nageak (197974-175)
- Charles S. Hugo (197974-171)
- Doreen Simmonds (197974-150)
- Joseph Akpik, Inupiat Community of the Arctic Slope (197974-113)
- Mark Major, ConocoPhillips Alaska (197974-093)
- Paul Hugo, North Slope Borough Assembly (197974-155)

Anchorage, Alaska **(Document Identification Number 197975).** The public subsistence-related hearing in Anchorage was held on June 28, 2004 in the Wilda Marston Theatre at 7 p.m. Approximately 33 people attended this hearing. The following attendees provided comments for the record:

- Deborah Williams, Alaska Conservation Foundation (197975-163)
- Eleanor Huffines, Wilderness Society (197975-122)
- Gregory Hebertson, Anadarko Petroleum (197975-104)
- John Schoen, Audubon Alaska (197975-089)
- Larry Houle, Alaska Support Industry Alliance (197975-195)
- Lynn Johnson, Dowland-Bach Corporation (197975-062)
- Paula Easley (197975-189)
- Rachel James, Alaska Coalition (197975-149)
- Rick Mott, ConocoPhillips Alaska (197975-076)
- Sara Chapell, Sierra Club (197975-114)
- Tadd Owens, Resource Development Council for Alaska (197975-066)
- Ted Von Hippel (197975-139)
- Tim Leach (197975-178)
- Tom Hendrix, Kuukpik Carlile Transportation, LLC (197975-203)

Atqasuk, Alaska **(Document Identification Number 197979).** The public subsistence-related hearing in Atqasuk was held on August 10, 2004 in the Community Center at 7 p.m. Approximately 36 people attended this hearing. The following attendees provided comments for the record:

- Bernadine Itta (197979-023)
- Mark Major, ConocoPhillips Alaska (197979-008)
- Thomas Itta, Sr. (197979-027)

Barrow, Alaska **(Document Identification Number 197980).** The public subsistence-related hearing in Barrow was held on August 12, 2004 in the Inupiat Heritage Center at 7 p.m. Approximately 76 people attended this hearing. The following attendees provided comments for the record:

- Beverly Hugo (197980-103)
- Charles Brower, North Slope Borough, Wildlife Department (197980-011)
- Charles Okakok (197980-175)
- Craig George, North Slope Borough, Department of Wildlife Management (197980-295)
- Douglas Edwardsen (197980-131)
- Edith Vorderstrasse (197980-186)
- Edward Itta (197980-048)
- Elsie Itta, Native Village of Barrow (197980-079)
- Geoff Carroll (197980-035)
- George Edwardsen (197980-196)
- Harry Brower, Jr. (197980-278)
- James Patkotak, Inupiat Community of the Arctic Slope (197980-111)
- Janice Meadows (197980-252)
- Jenny Ahkivgak (197980-274)
- Johnny Brower (197980-149)
- Ken Donajkowski, ConocoPhillips Alaska (197980-160)
- Kenneth Toovak Jr. (197980-063)
- Linda Wenning (197980-120)
- Mae M. Akpik (197980-228)
- Marie Carroll (197980-068)
- Max Ahgeak, Ukpeagvik Inupiat Corporation (197980-220)
- Paul Ningeok (197980-134)
- Percy Nusunginya, Native Village of Barrow Inupiat Traditional Government Council (197980-029)
- Richard Glenn, Arctic Slope Regional Corporation (197980-089)
- Richard Hutchinson (197980-271)
- Robert Edwardsen, Sr. (197980-106)
- Taqulik Hepa (197980-237)
- Warren Matumeak (197980-127)
- William Itta (197980-261)

Bethel, Alaska **(Document Identification Number 197978).** The public subsistence-related hearing in Bethel was held on August 17, 2004 in the Cultural Center at 7 p.m. Approximately nine people attended this hearing. The following attendees provided comments for the record:

- Agnes Pete Phillips (197978-071)
- Myron Manning, Association of Village Council Representatives (197978-050)
- Sally Rothwell, ConocoPhillips Alaska (197978-056)
- Stan Senner, Audubon Alaska (197978-087)

Fairbanks, Alaska **(Document Identification Number 197976).** The public subsistence-related hearing in Fairbanks was held on June 29, 2004 in Noel Wien Library Auditorium at 7 p.m. Approximately 32 people attended this hearing. The following attendees provided comments for the record:

- Arthur Hussey, Northern Alaska Environmental Center (197976-076)
- Ben Johnson (197976-121)
- Brodie Anderson, Northern Alaska Environmental Center (197976-052)
- Buzz Otis (197976-110)
- Chris Johansen (197976-093)
- Dan Simien, Laborer's Local 942 (197976-071)
- Dave Miller (197976-099)
- Dean Rampy, Doyon (197976-106)
- Debbie Miller (197976-151)
- Don Lowry, Operating Engineers Local 302 (197976-084)
- Jeff Merkel (197976-115)

- Jim Drew (197976-080)
- John Whitehead, ConocoPhilips Alaska (197976-059)
- John Zuleger (197976-132)
- Kevin Pomeroy (197976-108)
- Leon Tomasic (197976-102)
- Leonard Collins (197976-157)
- Margaret Russell, Greater Fairbanks Chamber of Commerce (197976-125)
- Rosemary Ahtuangaruak (197976-136)
- Sean Rice, A. Phillip Randolph Institute (197976-147)
- Steve Thompson, Mayor, City of Fairbanks (197976-087)

Nuiqsut, Alaska **(Document Identification Number 197973).** The public subsistence-related hearing in Nuiqsut was held on August 9, 2004 in the Kisik Community Center at 7 p.m. Approximately 44 people attended this hearing. The following attendees provided comments for the record:

- Bernice Kaigelok (197973-137)
- Eli Nukapigak (197973-106)
- Frank Matumeak (197973-094)
- Joe Nukapigak (197973-076)
- Joseph Eviklook (197973-071)
- Leonard Lampe, Kuukpik Subsistence Oversight Panel (197973-044)
- Maggie Kavosky (197973-111)
- Mark Ahmakak (197973-098)
- Rosemary Ahtuangaruak, Major, City of Nuiqsut (197973-117)
- Sally Rothwell, ConocoPhillips Alaska (197973-027)
- Sarah Kunaknana (197973-113)
- Thomas Ahtuangaruak (197973-132)

Washington D.C. **(Document Identification Number 197977).** The public subsistence-related hearing in Washington, D.C., was held on July 1, 2004 in the Pentagon City Doubletree Hotel at 7 p.m. Approximately 87 people attended this hearing. The following attendees provided comments for the record:

- Adam Kolton (197977-275)
- Beth Porterfield (197977-224)
- Brian Moore, United States Public Interest Research Group (197977-057)
- Dana Rudd, ConocoPhillips (197977-112)
- David Drasin (197977-271)
- Douglas Jaslow (197977-221)
- Ed Mulrernin (197977-122)
- Erica Stanley (197977-201)
- Gregory Herbertson, Anadarko Petroleum (197977-099)
- Heather Rorer (197977-238)
- James Weiffenbach (197977-255)
- Jeanne Watson (197977-206)
- Jennifer Schmidt (197977-256)
- John Garder (197977-088)
- Jon Owen, Campaign for America's Wilderness (197977-031)
- Jonathan Guerrero (197977-157)
- Keith McCoy, National Association of Manufacturers (197977-009)
- Ken Leonard, American Petroleum Institute (197977-023)
- Kristen Cummings, National Wildlife Federation (197977-047)
- Leslie Catherwood, Wilderness Society (197977-165)
- Margaret Pardue (197977-181)
- Marie-Laure Coüet (197977-095)
- Mark Young (197977-150)
- Matthew Frattali (197977-235)
- Melinda Pierce (197977-197)
- Michael Woodbridge (197977-160)
- Mikaila Milton (197977-263)
- Natalie Brandon, Alaska Wilderness League (197977-171)
- Paul Baicich (197977-249)
- Paul Cicio, Industrial Energy Consumers of America (197977-067)
- Peter Guerrero (197977-152)
- Rachel Bocchino (197977-209)
- Randy Moorman, Earth Justice (197977-077)
- Sam Frank (197977-145)
- Sara Williams (197977-243)
- Tara Schoepke (197977-287)
- Tayleah Surratt (197977-214)
- Timothy Stephany (197977-135)

Anaktuvuk Pass, Alaska (Document Identification Number 197987). The ANILCA 810 public hearing in Anaktuvuk Pass was held on November 8, 2004 in the Community Center at 7:10 p.m. Approximately 15 people attended this hearing. The following attendees provided comments for the record:

- Laura Lou Ticket (197987-153)
- Paul Hugo (197987-150)

Atqasuk, Alaska (Document Identification Number 197986). The ANILCA 810 public hearing in Atqasuk was held on November 4, 2004 in the Community Center at 7:15 p.m. Approximately 18 people attended this hearing. The following attendees provided comments for the record:

- Arnold Brower (197986-225)
- Arnold Brower, Jr. (197986-297)
- Arnold Brower, Jr. amended (197986-354)
- Bernadine Itta (197986-277)
- Candace Itta (197986-316)
- Delbert Rexford (197986-240)
- Delbert Rexford on behalf of Weber Nungasak (197986-294)
- Ethel Burke (197986-267)
- Gail Wong (197986-300)
- Harry Brower (197986-309)
- James Aiken (197986-324)
- Joseph Akpik (197986-210)

Barrow, Alaska (Document Identification Number 197988): The ANILCA 810 public hearing in Barrow was held on November 5, 2004 in the Inupiat Heritage Center at 7:15 p.m. Approximately seven people attended this hearing. The following attendees provided comments for the record:

- Arnold Brower, Jr. (197988-198)
- Geoff Carroll (197988-211)
- Taqulik Hepa (197988-260)
- Joseph Leavitt (197988-254, 278)
- Delbert Rexford (197988-233)
- Linda Wenning (197988-274)

Bethel, Alaska (Document Identification Number 197989). Subsistence-related hearing in Bethel was held on November 11, 2004 in the Yupiit Piciryarait Cultural Center at 7:20 p.m. Approximately two people attended this hearing. The following attendee provided comments for the record:

- Joan Hamilton (197989-271)

Nuiqsut, Alaska (Document Identification Number 197990): The ANILCA 810 public hearing in Nuiqsut was held on December 1, 2004 in the Kisik Community Center at 5:20 p.m. Approximately eight people attended this hearing. The following attendees provided comments for the record:

- Della Tukle (197990-105)
- Dora Nukapigak (197990-008)
- Eli Nukapigak (197990-084)
- Frederick Tukle, Sr. (197990-109)
- Jim Allen (197990-093)

- Rosemary Ahtuangaruak (197990-076)
- Rosemary Ahtuangaruak on behalf of ICAS (197990-121)

6.3 General Comments and Responses

The comments below were expressed in many ways in many of the comment letters received. Although these comments are not specifically focused on the content of the Draft Amended IAP/EIS, the BLM believes that responding to these concerns on broader issues is appropriate.

Comment: The public did not have adequate opportunity to provide input.
Response: The NEPA process provides specifically for two public input opportunities—scoping and public meetings on the Draft Amended IAP/EIS. The 75-day scoping period of the Draft Amended IAP/EIS was formally initiated with the Notice of Availability (NOA) of the Draft Amendment to the Northeast National Petroleum Reserve - Alaska Integrated Activity Plan/Environmental Impact Statement and the Announcement of Public Subsistence-Related Hearings Schedule in the Federal Register on June 9, 2004. Scoping is specifically intended to give stakeholders and the public an opportunity to have input on the issues, alternatives, and mitigation measures of the Amended IAP/EIS. The public review and comment period on the Draft Amended IAP/EIS provides stakeholders and the public another opportunity to comment on the issues, alternatives, and mitigation measures as well as on the information and analyses in the Amended IAP/EIS. If scoping comments were not understood or were not considered in the Draft Amended IAP/EIS, the public comment period is an opportunity to clarify or repeat a concern. The comment period on the Draft Amended IAP/EIS was initially 60 days and was then extended an additional 2 weeks. Comments on the draft document were accepted through a variety of means—mail, facsimile, e-mail, website, and public meetings. The comments could be as lengthy and detailed as needed to fully convey concerns. Multiple comment letters could be submitted during the comment period to provide additional detail as it occurs to the commenter. In response to public requests for more time to comment on the Draft Amended IAP/EIS, the close of the public review and comment period on the Draft Amended IAP/EIS was extended from August 9 to August 23, 2004.

Comment: I hope you will take my comments seriously.
Response: The BLM received over 214,660 letters, postcards, e-mails, facsimiles, and web-based comments on the Draft Amended IAP/EIS. Every comment submission was reviewed by BLM staff. Comments on the content of the Draft Amended IAP/EIS were identified and responded to. A response to a comment may be revision or addition to the text of the Draft Amended IAP/EIS, or a direct answer to the comment, or both. Section 6.1 explains the criteria and process by which we identified, evaluated, and responded to substantive comments. Opinions regarding oil and gas leasing in the National Petroleum Reserve – Alaska, whether for, against, or ambivalent, are considered by the BLM management and decision-makers in preparing the ROD. Opinions are not analyzed in the Draft Amended IAP/EIS because they do not generate changes in the technical content. They are forwarded for management consideration and are part of the permanent record for this planning process. Many of the comments received are form letters. Comments that appeared in form letters or were expressed multiple times in multiple ways have been addressed in a response to a specific comment or have been summarized and responded to as a general comment.

Comment: Environmental Impact Statements are supposed to contain all possible and probable alternatives to the proposed action. The alternatives put forth in your draft environmental impact statement offer little in the way of balancing oil and gas development with protecting the area's wildlife, wilderness, or its residents' subsistence lifestyle.
Response: Under NEPA, we must "rigorously explore and objectively evaluate all reasonable alternatives" not all "possible and probable alternatives" to the proposed action. A reasonable alternative must meet the proposal objectives. As noted in Section 1.3 (Purpose and Need for the Proposed Action) of the Draft Amended IAP/EIS, the proposal's objectives were two-fold:

- Consider leasing portions of lands currently unavailable or under a No Surface Activity restriction to oil and gas leasing in the Northeast National Petroleum Reserve - Alaska; and

- Consider developing performance-based lease stipulations and ROPs that would provide the BLM greater flexibility in protecting important surface resources from the impacts of oil and gas activities, similar to those developed for the Northwest National Petroleum Reserve – Alaska.

The Amended IAP/EIS examines an array of alternative packages created by varying the area within the Planning Area that could be offered for oil and gas leasing and the conditions that would be applicable to that leasing, including provisions to protect wildlife, wilderness, and subsistence lifestyle. The four alternatives in the draft document (No Action, B, C, and D) developed for the final document adequately cover the range of reasonable alternatives.

Comment: The recent findings of the scientific community that oil and gas development have had very negative impacts on the Arctic terrain, contrary to the industry's assertions, makes critical a careful evaluation of any further Arctic development.

Response: The recent report by the National Research Council (2003), which examined previously published research, while expressing concerns over past and potential effects of oil and gas development, did not conclude that "oil and gas development have had very negative impacts on the Arctic terrain." Indeed, several decades of experience of the oil and gas industry have yielded technology and other strategies that minimize effects to the terrain. We have used much of the research reviewed by the NRC in our analysis of potential cumulative effects. The Amended IAP/EIS has made the rigorous and objective evaluation of the reasonable alternatives required by NEPA.

Comment: There are no provisions for renewable energy development. We should turn our focus to fuel economy and conservation, and then to alternative energy, and finally to further oil exploration and development. Draining the Arctic will just postpone the inevitable a little longer. It's time to get serious about alternative fuels and fuel efficiency. The administration argues that we need more independence from foreign oil. How is this proposal going to lessen our demand for oil? How can this relatively small amount of land provide us with the necessary petroleum to reduce our overseas imports? It would seem clear that we cannot expect even a dramatic increase in our domestic production to do much to satisfy our [U.S.] consumption, given we consume 25 percent of the world's oil production.

Response: As noted in Section 1.3.1 of the Amended IAP/EIS, the objectives encourage oil and gas leasing in Planning Area while requiring protection of important surface resources and uses. As such, alternative energy programs would not be included in the range of reasonable alternatives. In any event, the energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas exploration, development and production, conservation, and other energy sources such as wind, solar, geothermal, and nuclear. Each source makes a contribution to satisfying the need and each has ecological, technological, and economic advantages and disadvantages. For example, a recent Department of the Interior report eliminated Alaska from examination of the potential for public lands in the State to be used for wind power generation because the lack of an electricity distribution grid within the state limited the effectiveness of the technology. In the period envisioned by the proposed action, fossil fuels will continue to be the single largest component of the domestic energy stream.

Comment: My question on the issue is what is going to be the economic advantage to the exploitation of this area? What would the citizens of the U.S. get in return for opening the NPR-A to oil and gas leasing?

Response: The economy of the area is discussed in Section 3 of the Amended IAP/EIS. The Amended IAP/EIS examines an array of alternative packages created by varying the area within the Planning Area that could be offered for oil and gas leasing and the conditions that would be applicable to that leasing, and the potential effects to the economy under each alternative are discussed in Section 4. The production of oil and gas resources within the Planning Area could make a valuable contribution to the domestic production portion of the stream by offsetting declines in production from Prudhoe Bay, using the existing TAPS pipeline and tanker transportation and distribution system. If a decision is made to open all or part of areas currently closed to leasing in the Planning Area to oil and gas leasing, companies will competitively bid for leases. The money received from successful bids, annual rentals on the leased acreages, and royalties on produced oil and gas would be divided between the federal government and the State of Alaska. Federal statute provides that 50 percent of the receipts from sales, rentals, and royalties on National Petroleum Reserve – Alaska leases are to be paid to the State of Alaska semiannually. The federal law provides that, in allocating these funds, the State give "priority to use by subdivisions of the State most

directly or severely impacted by development of oil and gas" in the Reserve. The 1999 Lease Sale in the Planning Area resulted in $38.6 million in first year bonus bids and $1.7 million in first year rentals for the federal government. The federal government estimates future annual rentals due to the federal government from the 1999 Northeast National Petroleum Reserve - Alaska Lease sale to be $2 million. The 2002 Lease Sale in the Planning Area resulted in $31.9 million in first-year bonus bids for the federal government.

Comment: I oppose opening the Arctic National Wildlife Refuge to oil and gas drilling.
Response: Many comments received on the Amended IAP/EIS expressed concern about the Arctic National Wildlife Refuge (ANWR). This Amended IAP/EIS is for the Northeast National Petroleum Reserve – Alaska. Although both the National Petroleum Reserve - Alaska and the ANWR are located on the North Slope of Alaska, they are different, and not adjacent, areas. The area designated as a National Petroleum Reserve is the western part of the Arctic Coastal Plain and the Arctic Foothills Provinces. The ANWR is 100 miles to the east, adjacent to Canada. The National Petroleum Reserve - Alaska and the ANWR are managed by different federal agencies.

6.4 Specific Comments and Responses

The BLM responded to over 1,250 substantive comments. Key topics with 10 or more comments (and number of comments responded to) are as follows:

- Air Quality (103)
- Birds (160)
- Caribou (72)
- Cumulative Impacts Analysis (44)
- Effects of Spills (15)
- Global Climate Change (14)
- Marine Mammals (27)
- Monitoring (14)
- Purpose and Need (27)
- Sociocultural (22)
- Special Designation Areas (33)
- Stipulations and ROPs (205)
- Subsistence (35)
- Threatened and Endangered Species (19)
- Traffic (aircraft, watercraft, and pedestrian (16)
- Wildlife (26)

The follow section lists each comment, and a response. The reader is encouraged to refer to the original comment letter (using the comment letter number identifier) included on the CD provided with the Amended IAP/EIS.

TOPIC: AIR QUALITY

Comment From: Environmental Coalition (Comment Letter No. 197617)

AIR QUALITY In the 4.8.1 draft IAP/EIS discussion of Air Quality, the Relationship Between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity, the air quality discussion inexplicably relates only to natural gas. Id at 4-425 ("The risk to air quality from natural gas development, production, and transportation would be similar to the risk from oil development, production, and transportation. Degradation of air quality related to construction, placement, and operation of gas exploration and production facilities would be the same as those for oil exploration and production facilities."). Aside from the fact that this statement contains no details as required of a "detailed statement" under NEPA, it's omission of oil and gas impacts violates 40 C.F.R. § 1502.16(a)'s discussion requirement. **(Comment No. 197617-129)**

Response To: Comment 197617-129

The text has been revised to state that both oil and gas activities would have an impact on air quality on the North Slope, but once these activities cease, air quality would return to historic conditions.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Page 5, Summary of Impacts: The fourth full paragraph suggests that activities in the Planning Area are not expected to contribute substantially to greenhouse gas emissions, despite the earlier contention (page Exec. Summ.-1 , second bullet) that the energy resources of the NPR-A are essential for meeting national energy needs. Because combustion of fossil fuels is known to contribute to greenhouse gases, it seems reasonable that the contribution of activities within NPR-A to greenhouse gas emissions would be proportional to the degree to which its resources contribute to national energy consumption. If statements regarding greenhouse gases and national energy needs are included in this document, they should be supported with existing statistics or the best available estimates. References would also be needed for statistics and estimates. **(Comment No. 197618-011)**

Response To: Comment 197618-011

Global warming is a global problem. During the first quarter of 2004, daily global oil demand was 82 million barrels of oil. Under Alternative B, daily peak estimated oil production from the National Petroleum Reserve-Alaska would be approximately 252,000 bbl per day if oil prices were at the high end of the estimated range ($30/bbl). This would amount to approximately 0.3 percent of present global oil daily demand. Considering all of the potential greenhouse gas emissions, in addition to the burning of oil, the estimated contribution from the National Petroleum Reserve-Alaska would be very small.

Comment From: State of Alaska (Comment Letter No. 197620)

Air/Water Quality There should be more detail as to the effects of construction and production activities creating fugitive dust and its affect on the environment. Adverse fugitive dust occurs primarily in the summer but vehicles can track-out fine material from gravel mining operations in the winter also. Any fugitive dust control measures that may be available to reduce the fugitive dust should be explained. **(Comment No. 197620-111)**

Response To: Comment 197620-111

Construction and production activities would create fugitive dust and impact air quality. A discussion of these effects was added to sections 4.3.1.2, 4.4.1.2, and 4.5.1.2.

TOPIC: ALTERNATIVES, RANGE OF ALTERNATIVES, PREFERRED ALTERNATIVES

Comment From: CS Symington (Comment Letter No. 157751)

The entire Teshekpuk Lake Surface Protection Area deserves BETTER. Your preferred plan would reduce protection to just over 200K acres, less than five percent of the planning area, a level that can't begin to protect geese, caribou or the dozens of other species that now live there. Available science clearly indicates that geese are highly sensitive to disturbance during the molt and that caribou that give birth to their young in this area are at serious risk from the kind of disturbance your preferred alternative would permit. ***(Comment No.* 157751-004)**

Response To: Comment 157751-004

The area is an important wetland that supports large numbers of fish and wildlife as documented in the IAP/EIS. Stipulations and Required Operating Procedures have been designed to limit impacts in areas where potential development may occur.

Comment From: Kurt Schwarz (Comment Letter No. 182845)

Teshekpuk Lake Surface Protection Area - We oppose the reduction of the Surface Protection Area. This area, established by Secretary of the Interior Bruce Babbitt, is a minor part of NPRA, but it has very high wildlife values. It should be kept completely out of the oil and gas program. The established boundaries of 858,000 acres should be retained for the security of the wildlife, including the ban on surface occupancy for any oil and gas activities. This Surface Protection Area will be all the more valuable for wildlife as the surrounding lands of NPRA are developed for oil and gas. ***(Comment No.* 182845-002)**

Response To: Comment 182845-002

The BLM has developed a series of very restrictive mitigation measures to ensure minimal impacts from any oil and gas activities that may occur in the Northeast planning area in particular the Teshekpuk Lake Special Area which was created in 1976 by the Secretary of Interior as part of the Naval Petroleum Reserves Production Act of 1976; for a comprehensive description of the required operating procedures and stipulations, please see Section 2.6, Stipulations and Required Operating Procedures, of the Final IAP/EIS.

Comment From: Kurt Schwarz (Comment Letter No. 182845)

We oppose the reduction of the Surface Protection Area. This area, established by Secretary of the Interior Bruce Babbitt, is a minor part of NPRA, but it has very high wildlife values. It should be kept completely out of the oil and gas program. The established boundaries of 858,000 acres should be retained for the security of the wildlife, including the ban on surface occupancy for any oil and gas activities. This Surface Protection Area will be all the more valuable for wildlife as the surrounding lands of NPRA are developed for oil and gas. ***(Comment No.* 182845-005)**

Response To: Comment 182845-005

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Sharon Wyberg (Comment Letter No. 186677)

Further, the preferred alternative would diminish protection for the caribou by fully75 percent. Available science clearly indicates that geese are highly sensitive to disturbance during the molt. And it shows that caribou that give birth to their young in this area are also at risk from the kind of disturbance your preferred alternative would permit. ***(Comment No.* 186677-007)**

Response To: Comment 186677-007

The area is an important wetland that supports large numbers of fish and wildlife as documented in the IAP/EIS. Stipulations and Required Operating Procedures are designed to limit impacts in areas where potential development may occur.

Comment From: Mary Jo Forman Miller (Comment Letter No. 193978)

When the BLM took over the management of National Petroleum Reserve in Alaska, in 1976, it was mandated to provide maximum protection for the surface values of the area when making any development decisions. We do not feel that either plan reflects this mandate for what is the largest expanse of federally protected public lands left in the United States. ***(Comment No.* 193978-002)**

Response To: Comment 193978-002

This Draft IAP/EIS does not allow the BLM to abrogate its regulatory responsibility to take the action that is deemed necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the National Petroleum Reserve-Alaska, consistent with the requirements of the National Petroleum Reserve Policy Act (43 CFR 2361.1). The BLM believe the level of resource protection developed for this proposed Northeast Plan amendment, is similar to, or even greater than, the level of resource protection developed for the 1998 Northeast Record of Decision. A complete description of the general lease stipulation, required operating procedures, and all site specific lease stipulations are described in Section 2.6.2, Alternative B and Alternative C Stipulation(s) and Required Operating Procedure(s). For a comparison of the protections provided by these mitigations under the different alternatives, please see Table 2-2, Chapter 2, Alternatives.

Comment From: Mary Jo Forman Miller (Comment Letter No. 193978)

The Arizona Wildlife Federation strongly believes that, at the very least, the BLM should adopt Alternative A, the no action alternative. We further believe that you should go beyond Alternative A and provide the essential protections needed to maintain the extraordinary wildlife diversity in the area. ***(Comment No.* 193978-002)**

Response To: Comment 193978-002

This Draft IAP/EIS does not allow the BLM to abrogate its regulatory responsibility to take the action that is deemed necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the National Petroleum Reserve-Alaska, consistent with the requirements of the National Petroleum Reserve Policy Act (43 CFR 2361.1). The BLM believe the level of resource protection developed for this proposed Northeast Plan amendment, is similar to, or even greater than, the level of resource protection developed for the 1998 Northeast Record of Decision. A complete description of the general lease stipulation, required operating procedures, and all site specific lease stipulations are described in Section 2.6.2, Alternative B and Alternative C Stipulation(s) and Required Operating Procedure(s). For a comparison of the protections provided by these mitigations under the different alternatives, please see Table 2-2, Chapter 2, Alternatives.

Comment From: Elizabeth McCloskey (Comment Letter No. 196086)

Alternative A, the "No Action" alternative, is the only alternative worth considering because it would maintain protection for the entire Teshekpuk Lake Surface Protection Area. This extraordinary ecosystem provides critical habitat for molting geese and nesting habitat for the Threatened Steller's eiders, declining northern pintails, rare and secretive yellow-billed loons and numerous other species. It also supports a vitally important caribou herd that Alaska natives depend on for their subsistence. If the caribou migration route is disturbed by oil and gas development and thereby altered, and the subsistence hunters have to go somewhere else to hunt, the native peoples will be severely adversely affected. ***(Comment No.* 196086-006)**

Response To: Comment 196086-006

Your concerns regarding the potential effects of development on wildlife in the TLSA is legitimate and shared by many others including regulatory agencies. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and other waterfowl including threatened eiders, and species of concern such as yellow-billed loon and northern pintails, to the potential impacts of oil development. Your comments were considered in developing the final Proposed Action.

Comment From: Michael R. North (Comment Letter No. 196264)

The range of alternatives considered in the draft EIS is inadequate (see page 2-9). Alternatives that would open up less areas than allowed in the 1998 ROD should be considered as well. They seem to be dismissed because of the 1998 ROD, but if that is the basis for dismissing them, than current Alternatives B and C should be dismissed as well. ***(Comment No. 196264-007)***

Response To: Comment 196264-007

Closing areas would not meet the stated objectives of this amendment process. In 2002, the President's National Energy Policy Development Group recommended that the President direct the Secretary of the Interior to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve – Alaska" and that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve – Alaska" (emphasis added). See Purpose and Need Section 1.3 in the Final Amended IAP/EIS.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The three alternatives presented in the Draft Plan are not a sufficient range of choices. As noted above, BLM has indicated on its project website and elsewhere that it has already made the decision to convert the existing 79 stipulations into performance-based mitigation measures. If this is the case, then Alternative A is meaningless as written. If this is not the case, then offering conflicting information on an issue of such central importance to reviewers violates the National Environmental Policy Act (NEPA) regulations governing the preparation of EIS alternatives. ***(Comment No. 196407-022)***

Response To: Comment 196407-022

One of the primary reasons the BLM has undertaken this IAP/EIS is to evaluate the impacts of changing stipulations to be more performance based (See Section 1.3.1, Purpose and Need). Alternative A is the No Action alternative, which is included in conformance with federal regulations at 40 CFR 1502.14(d). No decision will be made until final completion of the NEPA evaluation.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Not analyzed is a modified No Action Alternative that would seem logically to flow from a No Action adherence to the status quo paired with BLM's statements concerning its decision to restructure mitigation measures. Such an alternative would leave the areas now closed and off-limits to surface facilities as they are, while converting the stipulations from prescriptive to performance-based as they apply to the remaining acreage of the planning area. The statement that the decision has been made to make the conversion into thinking that this alternative is included in the document might understandably have misled a reviewer. It is not. A reviewer might understandably have been misled into thinking that support for Alternative A was meaningless if a conversion of mitigation measures was certain to occur. Such confusion over a choice that would predictably be the central focus of many potential commenters seems a plain and legally indefensible flaw in the Draft Plan. ***(Comment No. 196407-024)***

Response To: Comment 196407-024

The Draft IAP/EIS has provided a full range of alternatives and through this NEPA process has evaluated those alternatives, and compared the effectiveness of the prescriptive and performance-based mitigations. Evaluating the performance based mitigation measures within an Alternative (A) that does not provide leasing in or around the most sensitive areas of this planning area is of little value in terms of assessing the effectiveness of mitigations. Alternative C in the amended Draft IAP/EIS makes 100% of the Northeast Planning Area available for oil land gas leasing and it is under this Alternative (C) that oil and gas development would most likely occur; thereby, providing analysts an opportunity to assess or evaluate the effectiveness of the proposed performance-based stipulations and required operating procedures. The BLM strongly believes that the Performance-based stipulation and ROP package is superior to the Prescriptive approach used in Alternative A in the 1998 ROD; the adaptability and flexibility provided by the Performance-based strategy allows the BLM to make decisions based on new information and project-specific details. This allows mitigations to be adaptable to the specific needs of the area of potential impact from oil and gas activities. While we believe that the Performance-based are a better way to provide protection, we have made no final decisions.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The evaluation of Alternative A in the mandated ANILCA Section 810 Analysis of Subsistence Impacts found in Appendix B of the Draft reaffirms the conclusion of the 1998 analysis of the current management plan that the alternative would not significantly restrict subsistence uses and needs. We concur with the finding, but only to the extent that existing stipulations are strictly adhered to. Should the granting of exceptions to these stipulations become routine, and incremental impacts accumulate, restrictions on subsistence uses and needs could occur. The analysis also concludes with respect to both Alternative B and Alternative C that they would not significantly restrict subsistence uses and needs. We strongly disagree with these conclusions. We agree with the conclusion that the cumulative case would result in a reasonably foreseeable and significant restriction of subsistence use for at least four affected North Slope communities ***(Comment No. 196407-039)***

Response To: Comment 196407-039

Using BLM policy with regard making a finding under ANILCA, to determine if a restriction of subsistence uses and needs may result from an action the following three factors in particular are considered (from Kunaknana et al. vs. Watt, December 20, 1983):

- The reduction in the availability of subsistence resources caused by a decline in the population or amount of harvestable resources;
- Reductions in the availability of resources used for subsistence purposes caused by alteration of their normal locations and distribution patterns; and
- Limitations on access to subsistence resources, including from increased competition for the resources.

To determine if the restriction is "significant" the following factors are considered:

- when an action substantially reduces populations or their availability to subsistence users
- when an action substantially limits access by subsistence users to resources

To quote the decision:

"Significant restrictions are differentiated from insignificant restrictions by a process assessing whether the action undertaken will have no or a slight effect, as opposed to large or substantial effects."

The ANILCA 810 analysis of alternatives is based on the various analyses presented in the main body of the Environmental Impact Statement. The analyses presented in the EIS are based on the best available data, and are conducted by individual resource specialists, such as wildlife biologists, hydrologists, and other subject-matter experts. The ANILCA 810 findings are based on these individual analyses, and include all resources and habitat that could affect subsistence hunters, such as marine mammals, land mammals, fish, migratory waterfowl, and furbearers. The ANILCA 810 findings also rely on the social, economic, and subsistence analyses from the EIS. All of the analyses

from the main body of the document, based on the most-recent data available, indicated that there would be no impact at the population level for all resources under Alternatives B and C; that if displacement of resources was to occur, this displacement would be temporary and localized; and that there would not be any limitation in access to subsistence users. Therefore, the threshold of "may significantly restrict" as defined by the courts was not exceeded by the actions proposed in Alternatives B and C, resulting in a finding of "would not significantly restrict" subsistence uses and needs.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Our central concern with respect to the findings that neither Alternative B nor Alternative C would result in significant restriction of subsistence uses is that there is insufficient analysis to support the conclusions. BLM suggests that the avoidance of industrialized areas by subsistence users can be overcome by "effective communication and consultation by the oil industry, local communities, and the BLM". There is nothing to support this conclusion, no evidence that comparable efforts have been undertaken or ever proved successful to date, and no acknowledgement that if such efforts proved unsuccessful the conclusion of the analysis must be that there would certainly be significant restrictions of subsistence uses. Central also to BLM's conclusions is the degree to which proposed mitigation measures would provide protections comparable to those in place under the current plan. Here again, a comparison of the existing prescriptive measures and proposed performance-based measures reveals that the conversion is not simply one in form, but represents a significant potential weakening of protections now in place. Also unacknowledged in BLM's analysis is the potential for use of exception clauses to circumvent apparent protections. The granting of exceptions to mitigation measures for economic, technical, and other reasons unrelated to the objectives of the measures could significantly increase impacts on resources and subsistence. With the proposed mitigation measures and exception clauses written as they now are, it is clearly possible that their implementation could significantly restrict subsistence uses. BLM has not conducted an analysis of potential impacts under scenarios in which exception clauses allow non-compliance with mitigation measures that now appear to be a primary basis for the agency's conclusions that impacts to subsistence would be minimal. ***(Comment No. 196407-040)***

Response To: Comment 196407-040

Justification for the ANILCA findings is based on the impact analyses for Alternatives B and C which relies upon the analysis of each individual resource presented in the Draft IAP/EIS. Those analyses, which are based on the best available science, found that there would not be significant impacts to the resources from the proposed Alternatives. To determine if a significant restriction of subsistence uses and needs may result from any one of the alternatives discussed in the Amended IAP/EIS, including their cumulative effects, the following three factors in particular are considered:
1) the reduction in the availability of subsistence resources caused by a decline in the population or amount of harvestable resources;
2) reductions in the availability of resources used for subsistence purposes caused by alteration of their normal locations and distribution patterns; and
3) limitations on access to subsistence resources, including from increased competition of the resources.

The Draft IAP/EIS has provided a full range of alternatives and through this NEPA process has evaluated those alternatives, and compared the effectiveness of the prescriptive and performance-based mitigations. Evaluating the performance based mitigation measures within an Alternative (A) that does not provide leasing in or around the most sensitive areas of this planning area is of little value in terms of assessing the effectiveness of mitigations. Alternative C in the amended Draft IAP/EIS makes 100% of the Northeast Planning Area available for oil land gas leasing and it is under this Alternative (C) that oil and gas development would most likely occur; thereby, providing analysts an opportunity to assess or evaluate the effectiveness of the proposed performance-based stipulations and required operating procedures. The BLM strongly believes that the Performance-based stipulation and ROP package is superior to the Prescriptive approach used in Alternative A in the 1998 ROD; the adaptability and flexibility provided by the Performance-based strategy allows the BLM to make decisions based on new information and project-specific details. This allows mitigations to be adaptable to the specific needs of the area of potential impact from oil and gas activities. The final exclusion process has been amended to reflect that the granting of an exception must fully satisfy the objective(s) of the lease stipulation or ROP, please see Section 2.6.2.1 for a detailed description of the final proposed exception process. The BLM does not propose nor intend that the granting of exceptions would ever

become a standard procedure for authorizing land use activities. We have modified the exception process clause to state that the exception must satisfy the objective of the stipulation or ROP. Finally, the BLM only considers granting an exception after a proposal has been submitted by a lessee or other applicant. As a part of the exception process, impacts of the proposal are analyzed before any exceptions are granted. Please see specifically Section 2.6.2.1, Stipulations and Required Operating Procedures Exception Process, for a detailed description of the BLM permitting process and subsequent exception process. During numerous meetings and hearings held in the North Slope communities, participants have frequently voiced a recommendation that effective communication between industry (working on the North Slope) representatives, community representatives, and other participating organizations would substantially benefit the subsistence hunters, especially during the planning of hunting events. The BLM responding to these recommendations by developing Required Operation Procedures to address subsistence consultation for permitted activities; see ROP H-1 and H-2 in Section 2.6.2.2 of the Final IAP/EIS.

Granting of an exception is to occur only if the stated resource objective is met. The flexibility built in to many of the Stipulations and Required Operating Procedures is not to be construed as an additional exception process but as a mechanism to address resource issues based on project-specific information; see responses to 196264-006, 196407-015, 037 and 038 under Stipulations and Required Operating Procedures.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-7, Table 4-1: the data presented in the table seems open to question. It is counterintuitive to expect that for each listed activity, the frequency of occurrence would not change from current levels under the existing plan if either Alternative B or C were adopted, when they would open an additional 387,000 acres and 600,000 acres to leasing, respectively. It is predicted, for example, that there will be 4 acres disturbed for archeological research under Alternative A. It is unreasonable to assume that the same 4 acres would be disturbed with vastly more acreage open under the other two alternatives. It is predicted also, for example, that there will be 21 days of aerial wildlife surveys under Alternative A, but it is unclear whether this figure represents the number of calendar days on which surveys will be conducted or some measure of "total project days" calculated by multiplying the number of projects by the number of days of each project. This latter measure would be more meaningful in terms of assessing the potential impacts of the activity. ***(Comment No.* 196407-095)**

Response To: Comment 196407-095

Table 4-1, in Section 4.2.1.1 "Activities Not Associated with Oil and Gas Exploration and Development," was intended only to reflect activities unrelated to oil and gas exploration and/or development. These activities now typically occur and we do not believe the types and level of activities will change as a result of new oil and gas exploration and/or development.

Comment From: Conoco Phillips (Comment Letter No. 196557)

We do, however, propose that BLM do so through the imposition of the stipulations and ROPs proposed for Alternative C combined with additional No Surface Occupancy restrictions in certain highly sensitive areas outlined in the attached figure. This figure highlights those lakes identified in the DEIS as having the highest use by molting geese (Map 3-15 as >500 and > 1000 geese). Making the additional 213,000 acres north of Teshekpuk Lake available for leasing is the right geological and economic decision to make. Doing so through the imposition of designated No Surface Occupancy restrictions is the right environmental decision to make. Combined, the decision would protect certain highly sensitive resources but still allow enough surface access to explore and potentially develop hydrocarbon resources in this area. ***(Comment No.* 196557-030)**

Response To: Comment 196557-030

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Conoco Phillips (Comment Letter No. 196557)

CPAI supports a modification of Alternative C to allow leasing throughout the entire Northeast Planning Area but with implementation of selective No Surface Occupancy restrictions in the vicinity of highly sensitive geese molting lakes. We believe the legal, environmental and geologic data available to the BLM justify such a decision. Such a modification of Alternative C would not only comply with the mandates for management of the Petroleum Reserve and the President's energy policy, it would provide for a high level of environmental protection for the variety of important resources found in this area, and will maximize revenues to the federal, state, and local governments by allowing the greatest chance for exploration success. ***(Comment No.* 196557-044)**

Response To: Comment 196557-044

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Further, areas that are made available for leasing but do not allow permanent facilities (such as within 3 miles of Fish Creek) are of concern to CPAI. On the basis of subsurface data collected after the 1998 ROD for the Northeast Planning Area, much of the acreage within this setback is of great interest to us. The buffer should be scaled back to the original distance of 1.5 miles that was recommended during the 1998 EIS process. If, however, these restrictions are kept, the FEIS needs to retain the current process for granting exceptions that exists in the current ROD for the Northeast Planning Area. ***(Comment No.* 196557-045)**

Response To: Comment 196557-045

The BLM considered your comments during the development of the Final Proposed Action, however, we have left the buffer along Fish Creek at 3 miles.

Comment From: Conoco Phillips (Comment Letter No. 196557A2)

CPAI proposes a modification of Alternative C. This modification would allow leasing the entire Northeast Planning Area, including the 213,000 acres north of Teshekpuk Lake, but would do so by including certain No Surface Occupancy restrictions around those lakes designated as highly sensitive for geese molting. ***(Comment No.* 196557A2-003)**

Response To: Comment 196557A2-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Central Sierra Environmental Resource Center (Comment Letter No. 196940)

When over 87% of the 23.5 million acre preserve is available for oil and gas activity, we do not believe that opening this extremely valuable and sensitive ecological area reasonably balances oil development and biological resources. There is no scientific evidence to support the belief that best practice measures would sufficiently mitigate the environmental impacts to vulnerable wildlife populations. Therefore, we ask you to protect the entire Teshekpuk Lake Surface Protection Area and to Adopt Alternative A. ***(Comment No.* 196940-003)**

Response To: Comment 196940-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Terry Cummings (Comment Letter No. 196941)

I urge you to choose the 'No Action' (Alternative A) plan for the NPRA Northeast. There should be a balance between development and protection. Sacrificing vital habitat is too big a price to pay for oil. You must provide protection for the special places in the region such as the Teshekpuk Lake region. This is the most important wetland in the circumpolar north to migrating birds. It is also the breeding grounds for the caribou, and without breeding grounds, there is no caribou. ***(Comment No. 196941-001)***

Response To: Comment 196941-001

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Terry Cummings (Comment Letter No. 196941)

BLM's draft Environmental Impact Statement does not provide a balanced approach for oil development in the NE NPRA. Alternative B does not provide protection for the aforementioned areas and opens up too much land for oil development. Alternative C provides almost no protection for sensitive arctic areas and endangers unique and important wildlife habitat. Alternative A should be the preferred action plan.

Response To: Comment 196941-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Ducks Unlimited (Comment Letter No. 196943)

Presented with only the three alternatives evaluated in the draft EIS, we must support the No Action Alternative, Alternative A. However, Ducks Unlimited is not in opposition to additional oil and gas leasing in NPR-A, and we believe that a great disservice was done in structuring the draft EIS around only these three alternatives. The lack of an alternative that would have expanded leasing in much of NPR-A while maintaining protection of the globally significant waterfowl and other wildlife habitats is a critical flaw in the draft EIS. The lack of such an alternative unreasonably and unnecessarily constrains discussion, precluding development and consideration of a responsible, centrist approach to the development of energy resources in this region. ***(Comment No. 196943-003)***

Response To: Comment 196943-003

We believe a full range of alternatives has been analyzed. Alternative A makes no additional lands available for oil and gas leasing, while Alternatives B and C make additional lands available with Alternative C offering 100% of the planning area available for oil and gas leasing which includes the area northeast of Teshekpuk Lake. Both Alternatives B and C, while providing for additional oil and gas leasing also provides protections to key resources.

Comment From: Ben Long (Comment Letter No. 196948)

I am writing to the Planning Team out of great concern for the proposal by the Bureau of Land Management to reduce the size of the Teshekpuk Lake Surface Protection Area from 857,859 acres to 213,000 acres. Because this reduction in size will allow even more oil and gas development than is allowed currently, there will be inadequate protection of important habitat for nesting birds, molting geese and caribou that gather at Teshekpuk Lake each spring and summer. ***(Comment No. 196948-001)***

Response To: Comment 196948-001

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Ben Long (Comment Letter No. 196948)

Already 87% of the northeastern Reserve is open to leasing and 1.4 million acres are actively being explored. The additional proposed acreage will allow industrial infrastructure, human activity and overflights which will cause the birds and animals who use the area around Lake Teshekpuk to be overly stressed at a time when they are either molting, calving, or seeking relief from insects. These times are stressful enough for them. ***(Comment No. 196948-002)***

Response To: Comment 196948-002

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

The analysis in the current Draft Environmental Impact Statement (DEIS) does not support the opening of new areas of the Northeast NPRA to oil and gas leasing. Rather, the DEIS supports the adoption, by BLM, of "Alternative A , its "no action" alternative. Federal law requires that the substantial impacts to wildlife, habitat, and subsistence uses threatened by the present level of leasing (the "no action" alternative) must be mitigated to an extent that enables the North Slope subsistence communities to continue their subsistence lifestyle. With the 1998 Decision to open the Northeast NPRA to oil and gas leasing, BLM developed an extensive catalogue of mitigation measures. The effectiveness of these measures in protecting North Slope subsistence in the face of the level of development contemplated under the 1998 Decision has not been proven. Therefore, expanded leasing cannot be supported. ***(Comment No. 197605-008)***

Response To: Comment 197605-008

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Ornithologists (Comment Letter No. 197606)

We appreciate that BLM recognizes the need to preclude oil and gas development in an area of 213,000 acres north and east of Teshekpuk Lake in order to protect molting geese. The 213,000-acre no-lease zone, however, is too small to encompass all the essential habitat used by molting geese, and, because the environmental effects of oil development extend well beyond the immediate "footprint" of an oilfield (National Research Council 2003)—particularly as a result of aircraft overflights—the functionally protected area will be even smaller. The proposed 213,000-acre no-lease zone also is too small to encompass essential habitats for caribou having calves or seeking relief from insects, nor does it provide adequate protection for nesting birds, which are vulnerable to increased numbers of predators (e.g., gulls, ravens and foxes) attracted to Arctic oilfields (e.g., Truett, J.C. and S.R. Johnson 200017). ***(Comment No. 197606-010)***

Response To: Comment 197606-010

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: AOGA (Comment Letter No. 197608)

We are concerned that BLM has recommended the blanket exclusion of the 350 miles of additional prospective *acreage north of Teshekpuk Lake and that BLM has not addressed some of the extensive stream setbacks in the area The current three-mile setback is unnecessary and is double the 1.5 miles originally recommended in 1998.* ***(Comment No. 197608-006)***

Response To: Comment 197608-006

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: The Nature Conservancy (Comment Letter No. 197609)

Alternative B would reduce by nearly 75% the existing Teshekpuk Lake area closures. The table below shows the percentages of distribution among targets that are heavily represented in the Teshekpuk Lake area when the different protection boundaries under alternatives A and B are considered. For example, almost one half (46%) of the brant nesting colonies across the ecoregion are found in the current surface protection area. Alternative B applies closure to only 10% of the ecoregional distribution. Alternative C eliminates all closures in the Teshekpuk Lake area, and so, if it were without effective stipulations, has the potential to impact over half of the brant nesting colonies in the ecoregion. ***(Comment No.* 197609-014)**

Response To: Comment 197609-014

See response to comment 197617-072 under topic Special Designation.

Comment From: Ron Kim (Comment Letter No. 197611)

The increased air traffic, water alterations, habitat loss, and mortality that the EIS states will be "additive" impacts of the project on the Eiders are also incongruent with the requirements of the ESA. The EIS states that Alternative B will have greater impacts on both the whales and eiders because of the greater area used for exploration, and some area used for development. The long-term effects on the species, particularly the speculation that the Eiders will be displaced and find adequate habitat defy the ESA. ***(Comment No.* 197611-005)**

Response To: Comment 197611-005

The ESA requires consultation with the FWS on eiders. BLM is conducting this consultation.

Comment From: Mark Udall, Congress of the United States (Comment Letter No. 197613)

I strongly oppose your preferred alternative for amending the oil and gas leasing plan for the northeastern planning area of the National Petroleum Reserve-Alaska (NPR-A). I urge you to select Alternative A, the No Action Alternative, to sustain existing environmental and wildlife protection in the area, especially in the critical and fragile Teshekpuk Lake region. ***(Comment No.* 197613-001)**

Response To: Comment 197613-001

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Mark Udall, Congress of the United States (Comment Letter No. 197613)

The preferred alternative reduces protections for the Teshekpuk Lake area by 75 percent. The 213,000 no lease zone is too small to protect the molting geese and waterfowl and caribou that seek refuge there. Tens of thousands of geese, including brant, greater white-fronted goose, Canada goose and snow goose, molt in this area. During this flightless time, the geese are very sensitive to disturbance. There are also many nesting birds in this area, such as the threatened spectacled eider, yellow-billed loons and buff-breasted sandpipers. These species will also suffer from disturbance and the increased number of predators (e.g., gulls, ravens, and foxes) that are attracted to oilfields. ***(Comment No.* 197613-002)**

Response To: Comment 197613-002

See response to comment 197617-072 under topic Special Designation.

Comment From: Mark Udall, Congress of the United States (Comment Letter No. 197613)

Further, the preferred alternative would diminish protection for the caribou by opening up part of their critical calving and insect relief areas. Most of the concentrated calving area would now be open to leasing and industrial development in contrast to the 1998 ROD, which protected most of the concentrated calving area either in no-surface activity or no-leasing restrictions. For example, according to data analyzed by the Audubon Society, under Alternative A, 74 percent of the concentrated calving area (as defined by the University of Alaska Fairbanks, 2001) was protected. In contrast, under BLM's preferred alternative, only 12 percent of this sensitive area is protected. Thus, 88 percent of the Teshekpuk Lake herd's concentrated calving area would be at risk. **(Comment No. 197613-004)**

Response To: Comment 197613-004

See response to comment 197616-132 under topic Stipulations and ROPs and comment 197617-072 under topic Special Designation Areas.

Comment From: Mark Udall, Congress of the United States (Comment Letter No. 197613)

Important caribou insect relief habitat would also be open to leasing and industrial development under the preferred alternative. Alternative A protected 84 percent of the herd's insect relief habitat (as defined by maps prepared by ADF&G, NSB, ABR, 2003). BLM's Preferred Alternative significantly reduces that protected area; only 41 percent of insect relief habitat is now protected from leasing and industrial development. **(Comment No. 197613-005)**

Response To: Comment 197613-005

See response to comment 197616-132 under topic Stipulations and ROPs and comment 197617-072 under topic Special Designation Areas.

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

Alternative A-the No Action Alternative--keeps the 1998 plan in place, even though it inadequately addresses the protection of critical habitat in the NE. The 1998 plan relied heavily upon new drilling techniques to ensure environmental protection. In the six years since the ROD on the NE Reserve, oil exploration and drilling techniques and technologies have not advanced enough to render the plan obsolete---but many of the techniques assumed to be of importance are still in the developmental stage. The critical habitats in this area of the Reserve should not fall victim to these unproven tactics; hence the need for a full review of the 1998 document. **(Comment No. 197614-007)**

Response To: Comment 197614-007

We believe a full range of alternatives has been analyzed. Alternative A makes no additional lands available for oil and gas leasing, while Alternatives B, C, and the final Proposed Action Alternative D make additional lands available with Alternative C and D offering 100% of the planning area available for oil and gas leasing which includes the area northeast of Teshekpuk Lake. Alternatives B, C, and D, while providing for additional oil and gas leasing also provides protections to key resources.

Comment From: Anadarko (Comment Letter No. 197615)

The NPR-A potentially contains extensive oil and gas resources, although the extent and location of these resources within the NE NPR-A are currently unknown. Exploration is the critical first step in defining the extent of these resources and the economic feasibility of their development. Therefore, all of the lands within the NE NPR-A should be made available to oil and gas leasing. Environmentally responsible exploration on these leases can be achieved through the application of appropriate stipulations, required operating procedures and development of site-specific permitting requirements through an analysis conducted under the National Environmental Policy Act. **(Comment No. 197615-004)**

Response To: Comment 197615-004

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Anadarko (Comment Letter No. 197615)

Anadarko urges BLM to adopt and implement Alternative C in the record of decision. The NPR-A is one of the last few onshore areas remaining in North America that could contain large, conventional oil and gas resources. As such, these oil and gas resources must, consistent with the President's energy policy, be made available for environmentally responsible development to meet the ever growing energy demands of our nation. We believe implementation of Alternative C will achieve BLM's dual mandate to open the area to environmentally responsible oil and gas development while simultaneously minimizing potential impacts to the soil, water, air, vegetation, wildlife, archeological and paleontological resources. The protective measures included in Alternative C are more than adequate to mitigate potential impacts from oil and gas development and will protect the wildlife, environment and traditional uses of the land. ***(Comment No. 197615-007)***

Response To: Comment 197615-007

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Anadarko (Comment Letter No. 197615)

Were BLM to implement its Preferred Alternative instead of Alternative C, potentially important oil and gas resources in the Barrow Arch would be needlessly removed from development. Although we recognize that there are sensitive resources in and around this area that require protection, we believe that full leasing of the area should occur and that protection of sensitive resources can be successfully achieved through the adoption of performance based operating procedures and stipulations. ***(Comment No. 197615-008)***

Response To: Comment 197615-008

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Anadarko (Comment Letter No. 197615)

If BLM believes the whole area should not be opened to leasing, we nevertheless encourage BLM to open-the area north and east of Teshekpuk Lake, and defer a decision whether to open Teshekpuk Lake itself to leasing. Such an alternative would balance protection of the sensitive resources of the NE NPR-A with development of its energy resources. We believe that concerns regarding potential impacts to environmental resources and wildlife that may be raised as a result of opening the area north and east of the Lake to leasing can be addressed through site-specific analysis for a given project and the adoption of appropriate seasonal stipulations. ***(Comment No. 197615-009)***

Response To: Comment 197615-009

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The Amended Draft EIS itself has many deficiencies. Reasonable alternatives are left out of the Amended Draft EIS simply because they do not comport with the policy goals that the BLM is trying to implement through this amendment process. Additional alternatives need to be considered so that the BLM can fully consider the impacts of the alternative it has already decided to choose. [8-BLM]The Amended Draft EIS repeatedly states that the same level of protection to surface resources is provided by the 1998 NE NPR-A ROD and the performance-based mitigation measures that the BLM is pushing. This is demonstrably not true, and until the analysis reflects the true impacts, the

Amended Draft EIS cannot meet NEPA standards. **(Comment No. 197616-007)**

Response To: Comment 197616-007

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

While we question the legal basis of this amendment process, we are also commenting on the deficiencies in the Amended Draft EIS. One prominent deficiency is the failure to consider other reasonable alternatives. The consideration of a reasonable range of alternatives in an EIS is one of the basic tenants of NEPA, and so the failure to consider reasonable alternatives must be corrected. This failure is manifested in several ways. **(Comment No. 197616-072)**

Response To: Comment 197616-072

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

First, the BLM has announced from the beginning of this process that the stipulations adopted in the 1998 NE NPR-A ROD are going to change,66 yet there is really only one alternative that is consistent with the BLM's already-made decision. In other words, Alternative A was out the window from the first press release (and even earlier, according to stories in Petroleum News Alaska and other oil industry-related publications). Alternative C is equally a no-hoper because it would open up every last acre of the Northeast Planning Area, and such an extreme position simply could not withstand challenge in light of the critical habitat areas involved and Congress' mandate that our subsistence way of life be protected. That leaves everyone wishing to comment with just Alternative B to choose from. Yet when it comes to opening some portion, but not all, of a previously restricted area of over 589,000 acres to leasing, having only one alternative presented or analyzed gives short shrift indeed to the variety and complexity of the areas, the habitat and the resources involved. While brevity is nice, it shouldn't come at the expense of a fair and thorough look at a realistic range of alternatives. **(Comment No. 197616-073)**

Response To: Comment 197616-073

An essentially infinite number of alternatives could be created through creating different combinations of stipulations and ROPs and different land allocations. The important consideration is that the alternatives considered include the full range of protective requirements and land allocations. The range of alternatives included in the Draft IAP/EIS does so.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

With that summary in mind, let's take a more detailed look. The Amended Draft EIS has three "alternative" packages of mitigation measures. Alternative A is the No Action Alternative which maintains the "prescriptive based" stipulations that were adopted in the 1998 ROD. And then there are Alternatives B and C, both of which include the exact same "performance-based" stipulations (with the exception of the set back for the Tingmiaksiqvik river, identified on USGS maps as the Ublutuoch River, which is only included in Alternative B).67 At the outset, it would appear that we have been presented with basically only two "alternative" mitigation measure packages and that our comments here will help the BLM pick and choose between the two alternatives. But, this appearance is only an illusion, since before the Amended Draft EIS was even published we were told by the BLM's Northeast NPR-A website:

The BLM will reformat current prescriptive stipulations that apply to the Northeast National Petroleum Reserve - Alaska into a mixture of prescriptive and performance-based stipulations similar to those developed for the Northwest portion of the Reserve.68 **(Comment No. 197616-074)**

Response To: Comment 197616-074

One of the primary reasons BLM has undertaken this IAP/EIS is to evaluate the impacts of changing stipulations to be more performance based. (See Chapter 1.3.1, Purpose and Need) No decision can be made to make this change until completion of a NEPA evaluation.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Agency representatives also told us that the BLM had already decided that performance based ROPs will be adopted in the end.69 The pre-ordained outcome of this NEPA process is only confirmed in the Amended Draft EIS which states that this planning process will:

Develop performance-based measures to protect important surface resources form the impacts of oil and gas activities, similar to those developed for the Northwest National Petroleum Reserve - Alaska. ***(Comment No. 197616-076)***

Response To: Comment 197616-076

See response to comment 197616-074 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

So, maintaining the stipulations developed in the 1998 NE NPR-A ROD has never been an alternative.71 The BLM also dismisses the request we made during scoping that it "develop and examine an alternative . . . that strengthens the existing NE NPR-A ROD's subsistence stipulations" because it does not fall within the realm of the performance based measures that defines the scope of its purpose. ***(Comment No. 197616-078)***

Response To: Comment 197616-078

Alternatives B and C offer strengthened subsistence protection through their proposed stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

NE NPR-A Scoping Letter p. 38; Amended Draft EIS p. 2-10. The BLM should have also considered a program using local residents to monitor industry activities and to check on compliance with the applicable stipulations or ROPs. We brought this up in our Scoping Letter as an alternative that should be considered. NE NPR-A Scoping Letter p. 38-39. ***(Comment No. 197616-080)***

Response To: Comment 197616-080

This IAP/EIS amendment is designed to address oil and gas leasing and development issues. Questions of whom to hire to fulfill agency compliance and monitoring responsibilities is outside the scope of analysis.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

When it comes to opening more land for leasing in the Northeast NPR-A the BLM has 589,000 acres that contains highly sensitive wildlife habitat that it needs to consider. There is no explanation in the Amended Draft EIS why, under Alternative B, 213,000 acres is unavailable for leasing or how the location of the 213,000 acres that are not available for leasing in this scenario were chosen.76 Maybe if the 213,000 acres where leasing is not allowed under Alternative B were shifted to different parts of the area around Teshekpuk Lake, the impacts of making the additional acreage available to leasing would be significantly different. Or, what if, in addition to withholding 213,000 from leasing, some additional acreage that is of high value to wildlife is also made unavailable for leasing. These are the types of alternatives that need to be analyzed in order to sharply define the issues and provide the BLM a clear basis for choice among options.77 Consideration of other reasonable leasing scenarios is also necessary to determine

under Section 810 of ANILCA whether the use, occupancy, or disposition of subsistence lands can be reduced or eliminated. ***(Comment No.* 197616-082)**

Response To: Comment 197616-082

See response to comment 197616-073 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Another deficiency in the Amended Draft EIS is the systematic failure to consider or analyze the differences between the 1998 NE NPR-A ROD and the mitigation measures proposed for Alternatives B and C. Instead of finding analysis, we find that the Amended Draft EIS repeatedly makes conclusory statements that the package of mitigation measures proposed under Alternatives B and C would provide the same level of protection to surface resources as the stipulations adopted in the 1998 NE NPR-A ROD. For example, page 2-11 says: In the end, the level of resource protection developed in the Northwest National Petroleum Reserve - Alaska, the Preferred Alternative [Alternative B] and Alternative C of this amendment, is similar to, or even greater than, the level of resource protection provided in the 1998 Northeast IAP/EIS Record of Decision.80 ***(Comment No.* 197616-087)**

Response To: Comment 197616-087

The BLM believes we have taken a hard look at any differences and/or similarities between the new proposed Performance-based mitigations and the current 1998 Record of Decision, and performed the necessary and adequate analyses on the potentially impacted surface resources throughout the document. The stipulations and ROPS presented as part of the action alternatives are not that dissimilar to the 79 stipulations from the 1998 NE NPR-A ROD in that the resource objectives are the same, but now clearly stated; and the requirements and standards listed in the new Stipulations and ROPS also reflect knowledge gained through past experience, but now allow more opportunity to refine the requirements based on new information and experience. We believe that monitoring to insure that the requirements and standards are effective and accomplishing the desired result is a good thing and a more meaningful exercise if ineffective measures can be strengthened. Also see response to comment 196407-011 under Stipulations and ROPs

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

In addition to these failures to consider across-the-board differences between the 1998 NE NPR-A ROD and Alternatives B and C, the Amended Draft EIS fails to consider specific differences between the 1998 NE NPR-A ROD and Alternatives B and C. Take, just for example, the many differences that are not considered in the analysis of the impacts to fish under the different alternatives discussed on pages 4-192 to 4-197 of the Amended Draft EIS. These are: ***(Comment No.* 197616-105)**

Response To: Comment 197616-105

See responses to comments 197616-105 through 197616-108 under Fish and 197616-109 under Alternatives.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The Amended Draft EIS says that both alternatives "require extensive ecological mapping of proposed development sites in order to access [SIC] and minimize impacts to sensitive wildlife and fish habitats."105 That's not quite correct either. The 1998 NE NPR-A requires more than just mapping - it also required consultation with federal, state, and NSB regulatory and resource agencies to identify key wetlands (including fish bearing lakes and streams) and for lessees to minimize the impact of industrial development on these wetlands.106 Minimizing impacts includes avoiding siting facilities in the identified wetlands if feasible. None of this is required in Alternatives B and C. ***(Comment No.* 197616-109)**

Response To: Comment 197616-109

The Draft Amended IAP/EIS is correct to indicate that both Alternative A and Alternative B require ecological mapping. ROP E-12 does not include some language in Stipulation 46. The deleted language cited in the comment regarding consultation and minimization of impacts to wetlands is unnecessary because prior to development a NEPA process and a 404(b)(1) wetlands permit process would be required. Through these processes consultation and minimization of impacts to wetlands are required.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The plain and simple fact is that after the necessary and required analysis of the mitigation packages proposed for Alternatives B and C is done, the BLM will have to reach the conclusion that less protection to surface resources is provided by these alternatives than under the 1998 NE NPR-A ROD. Our organizations and the community of Nuiqsut are completely and vehemently opposed to any weakening of the protection measures that are currently in place. ***(Comment No.* 197616-126)**

Response To: Comment 197616-126

See response to comments 196407-011 and 197616-099 under topic Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Digging a little deeper we find that the BLM is actually proposing fewer caribou protections in the Teshekpuk Lake Special Area than it did under any alternative in 1998.130 Essentially then, we find that we are losing some of even the lowest levels of protections considered in the 1998 NE NPR-A EIS/IAP. This isn't even the "environmentally responsible" leasing that the NEPDG recommended, it looks more like the leasing of additional acreage, pure and simple. ***(Comment No.* 197616-135)**

Response To: Comment 197616-135

In addition to the planning area wide Stipulations and Required Operating Procedures, see sections A – J under Alternative D Stipulations and Required Operating Procedures, several area specific measures are incorporated in the final Proposed Action that provide significant protection to surface resources within the Teshekpuk Lake Special Area. These measures include deferring Teshekpuk Lake from leasing; creating No Surface Occupancy areas (a) within ¼ mile of Teshekpuk Lake (stipulation K-3) and other deep water lakes (stipulation K-2), (b) within ½ mile or more of goose molting lakes (stipulation K-4) and (c) in important caribou movement and calving areas (stipulations K-9 and K-10); and limiting permanent surface disturbance from oil and gas related development north of Teshekpuk Lake to approximately 0.5 -0.6 % of the lease tract (stipulation K-11)

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Alternatives D and E in the 1998 NE NPR-A EIS/IAP considered leasing between 73% and 100% of the Teshekpuk Lake Special Area and included surface restrictions that are basically identical to lease stipulations K-5. NE NPR-A ROD Lease Stipulations, 25, 29, 33, 49, 50, 52, 54, 55; 1998 NE NPR-A EIS-IAP pp. II-42 through II-48, Stipulations 24, 31, 37, 50, 53, 55, 56. In addition, more protective mitigation measures were included in stipulation 26 (2 mile buffer along the coast where only critical surface facilities would be permitted) and stipulation 28 applicable to Alternative E only (restrictions on development to the east of Teshekpuk Lake (an area that would not be leased in Alternative D considered in the 1998 NE NRP-A EIS/IAP)). Alternatives B and C do not have equivalent protections. ***(Comment No.* 197616-137)**

Response To: Comment 197616-137

See response to previous comment 197616-135.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Using this Purpose and Need as its guide, BLM developed and considered five action alternatives. All but one of those alternatives would have made less land available for oil and gas leasing than the amount of acreage which BLM now proposes should be opened to leasing in its draft IAP/EIS. ***(Comment No. 197617-024)***

Response To: Comment 197617-024

The BLM is considering making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing in accordance with the President's energy policy. The discussion on page 1-5 of the Draft Amended IAP/EIS focused on activities in the Northeast National Petroleum Reserve. The September 2003 MMM 9.1 million acre Lease Sale 186 is discussed in Section 4.6.5.7, Federal Lease Sales Considered in this Cumulative Effects Analysis, in addition to the 2004 Cook Inlet sale. As noted in this section, although large amounts of area have been leased, and about 30 wells drilled, all wells have been plugged and abandoned because field economics have not favored production. Based on production at the Alpine Field, and proposed for the Alpine Satellite Development, economically producible oil has been found in the Planning Area, and there is a high potential for more economically producible oil to be found within the TLSA. Careful oversight and use of stipulations and ROPs would allow for protection of natural and cultural resources while allowing for development of petroleum resources.

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM here has without justification focused on a very narrow proposed action that is not consistent with the broad purpose to serve its general management obligations and its statutory directives, including protection of critical surface resources of the Reserve. The draft IAP/EIS does not identify changes in these Congressional directives which require amendment of the 1998 IAP/EIS and ROD to allow more oil and gas leasing. In fact the draft IAP/EIS acknowledges that if anything, the oil industry has found more reserve potential in the available Northeast Planning Area acreage than was previously anticipated (draft IAP/EIS at 1-5). BLM further acknowledges that since 1998, the agency has also opened an additional 8.8 million acres (100% of the Northwest Planning Area) to oil and gas leasing. In this discussion, however, BLM fails to include the September 2003 Minerals Management Service 9.1 million acre offering (Lease sale 186) in the adjacent Beaufort Sea to oil and gas leasing. These facts clearly illustrate that there is plenty of land already open for leasing and that BLM should therefore be more protective of the Teshekpuk Lake Special Area to fulfill it's management responsibility to balance resource protection against what now obviously is an extreme oil and gas leasing agenda being pursued by the Bush Administration. ***(Comment No. 197617-024)***

Response To: Comment 197617-024

The BLM is considering making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing in accordance with the President's energy policy. The discussion on page 1-5 of the Draft Amended IAP/EIS focused on activities in the Northeast National Petroleum Reserve. The September 2003 MMM 9.1 million acre Lease Sale 186 is discussed in Section 4.6.5.7, Federal Lease Sales Considered in this Cumulative Effects Analysis, in addition to the 2004 Cook Inlet sale. As noted in this section, although large amounts of area have been leased, and about 30 wells drilled, all wells have been plugged and abandoned because field economics have not favored production. Based on production at the Alpine Field, and proposed for the Alpine Satellite Development, economically producible oil has been found in the Planning Area, and there is a high potential for more economically producible oil to be found within the TLSA. Careful oversight and use of stipulations and ROPs would allow for protection of natural and cultural resources while allowing for development of petroleum resources.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Thus, BLM has unreasonably focused its proposed action on opening closed areas and weakening protective stipulations, even though such a narrow focus is not required by the purpose of the action-to fulfill BLM management responsibilities and respond to Congressional and Presidential directives-and even though this proposed action is actually inconsistent with BLM's fundamental obligation to protect the fish, wildlife, subsistence, wilderness and other values of the Reserve. ***(Comment No. 197617-032)***

Response To: Comment 197617-032

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Environmental Coalition (Comment Letter No. 197617)

INADEQUATE RANGE OF ALTERNATIVES BLM has impermissibly rejected consideration of reasonable alternatives that are consistent with the overall purpose of the draft IAP/EIS. Because the purpose and need of the draft IAP/EIS is to "carry out its management responsibilities" under the NPRPA, FLPMA, and NEPA, among the reasonable alternatives BLM must consider are those considered but rejected in 1998. After all, the same "management responsibilities" under NPRPA, FLPMA, and NEPA drove development and consideration of those alternatives. BLM cannot eliminate those alternatives from analysis now by classifying its proposed change to the 1998 IAP/EIS as a mere "amendment." See draft IAP/EIS at 2-9. Nothing in 40 C.F.R. § 1502.9, governing the preparation of supplemental EISs, allows BLM to eliminate from consideration reasonable alternatives within the parameters of the purpose and need for the action. Denominating BLM's new EIS an Amended EIS does not excuse BLM from the duty to review all reasonable alternatives. ***(Comment No.* 197617-033)**

Response To: Comment 197617-033

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Environmental Coalition (Comment Letter No. 197617)

Indeed, since 1998 there have been significant developments that require reconsideration of BLM's rejection of the more conservation oriented alternatives rejected in 1998. Among these developments, BLM has recently decided to lease all 8.8 million acres of Northwest Planning Area of the Reserve, which decision it claims already serves the directive in the President's energy policy to make lands available for leasing. See Northwest NPRA ROD (January 2004), at 3. Further, there have occurred a number of lease sales in both the Northwest and Northeast Planning Areas of the Reserve; exploration (drilling and seismic) has occurred at multiple sites in the Northeast Planning Area; and ConocoPhillips Alaska, Inc. has discovered oil and gas in the Northeast Planning Area and submitted a satellite development proposal to BLM for these discoveries. These actions have dramatically increased the development pressures on the Reserve and its natural resources and thus made the reconsideration of the less aggressive development alternatives rejected in 1998 not only timely, but prudent and reasonable. In fact, ConocoPhillips's discoveries in areas open to leasing under the 1998 ROD prove that there is no need to open areas closed to leasing under the same ROD. These discoveries prove that oil and gas resources can be found in areas outside of the Teshekpuk Lake Surface Protection Area and that there is no need to put these internationally significant wildlife and subsistence resources at risk. ***(Comment No.* 197617-034)**

Response To: Comment 197617-034

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Environmental Coalition (Comment Letter No. 197617)

For all of these reasons, if BLM elects to go forward with the amendment process, the agency must include and analyze Alternatives B and C from the 1998 IAP/EIS in the draft IAP/EIS. BLM must also include and analyze alternatives BLM failed to consider in the 1998 IAP/EIS and this draft IAP/EIS. To comply with NEPA, FLPMA and NPRPA, BLM must consider an alternative that includes permanent protection for the Teshekpuk Lake Special Area, Colville River Special Area and other biological hot spots in the Northeast Planning Area. In addition, BLM must consider an alternative that strengthens the inadequacies of 1998 ROD stipulations detailed in our March 12, 1998 Northeast Planning Area draft IAP/EIS comments hereinafter incorporated by reference. ***(Comment No.* 197617-036)**

Response To: Comment 197617-036

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Environmental Coalition (Comment Letter No. 197617)

As also pointed out in our Northwest comments, at 61 et seq. (comments incorporated herein by reference), the mitigation measures for the Northeast Planning Area adopted in the 1998 ROD are inadequate to protect the resources of the Planning Area. Yet now BLM proposes to weaken them further by substituting significantly weaker and even more discretionary stipulations and so-called Required Operating Procedures ("ROPs"). Rather than weakening the already deficient protections used in the Northeast Planning Area, BLM should have provided for additional protections in a new alternative in this draft IAP/EIS. Moreover, at the very least BLM should have provided some rationale for its choice to weaken the already deficient and addressed the potential impacts of the weakened protections. BLM's failure to do so renders the public and the agency incapable of making an informed decision about the sufficiency of the protections. A promise of greater protection (draft IAP/EIS at 2-11) is simply not enough. ***(Comment No.* 197617-165)**

Response To: Comment 197617-165

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Environmental Coalition (Comment Letter No. 197617)

If BLM intends to proceed with this amendment process, the agency must complete a revised Amended IAP/EIS to correct the legal and scientific inadequacies outlined above and in the original 1998 IAP/EIS. In a revised Amended IAP/EIS, a management alternative must be selected that provides adequate protection to the ecological, wildlife, subsistence, cultural and wilderness resource of the Northeast Planning Area and the public must be given an opportunity to comment on that alternative. A more balanced, science based approach to energy development and environmental protection would enhance resource protection from the 1998 ROD and at a minimum do the following in the Northeast Planning Area:

Permanently protect the Teshekpuk Lake Special Area, Colville River Special Area, and other biological hotspots. Protect the North Slope and Yukon Kuskokwim Delta communities' subsistence resources. Strengthen monitoring and lease stipulation requirements. ***(Comment No.* 197617-184)**

Response To: Comment 197617-184

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Page 3, Alternative B (Preferred Alternative): Here and throughout the DEIS, it is stated that performance-based Stipulations and ROPs "would be used to mitigate impacts.. ." In recognition of the uncertainty regarding the implementation and effectiveness of these measures, the text should reflect that they "are intended to mitigate impacts.. .".

Response To: Comment 197618-004

Wording of text was altered to reflect the intended mitigation from the performance-based Stipulations and ROPs (Executive Summary and Chapter 4).

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Page 4, Summary of Impacts: The final paragraph on this page states that Alternative C could result in increased levels of impact due to oil field development in the caribou insect-relief area. It should be noted that under both

Alternatives B and C, greater impacts to caribou would be expected due to potential development within the Teshekpuk Lake Caribon Herd's core calving habitat to the south, east and north of Teshekpuk Lake in areas that are currently protected as no-lease or no-surface-occupancy areas. ***(Comment No.* 197618-006)**

Response To: Comment 197618-006

Changed text to read "One is oil field development in the caribou insect-relief area and in the Teshekpuk Lake Caribou Herd's core calving grounds to the south, east, and north of Teshekpuk Lake, which are currently protected as no-leas or no-surface-occupancy areas."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.2, Page 2-4, Formulation of Alternatives and 2.6, Page 2-1 1, Stipulations and Required Operating Procedures: These sections suggest that protection of surface resources under the draft Preferred Alternative and Alternative C would be equal to or greater than protection under the No Action Alternative. As recognized by the BLM, making some areas unavailable for leasing provides a high level of protection for surface resources. Combined with uncertainties regarding implementation and effectiveness of proposed mitigation measures, it seems clear that alternatives that open a larger area to oil leasing and development, particularly in biologically sensitive areas, will not achieve the same level of resource protection as an alternative that prohibits leasing and development in these areas. In this regard, the Service believes the No Action Alternative, as compared to Alternatives B and C, would offer greater protection of surface resources, particularly for trust resources within the existing no-lease and no-surface occupancy areas in the vicinity of Teshekpuk Lake. For this reason, the Service prefers the protective measures of the No Action Alternative as compared to Alternatives B and C. ***(Comment No.* 197618-017)**

Response To: Comment 197618-017

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.2.1.1, Page 2-5, Rivers Area: Given its importance to fish and subsistence, it is unclear why the Tingmiaksiqvik (Ublutuoch) River would only receive protection under the draft Preferred Alternative. This river should receive equal protection under all Alternatives. ***(Comment No.* 197618-019)**

Response To: Comment 197618-019

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Appendices B.2.2.1, Page B-7, Evaluation of the Effect of Use, Occupancy, or Disposition on Subsistence Uses and Needs: This section needs to mention the potential effects of Alternatives B and C on Native peoples in western, south western, and interior Alaska if long-term impacts to molting geese were to occur. ***(Comment No.* 197618-114)**

Response To: Comment 197618-114

The evaluation has been expanded to include a discussion of potential effects of oil and gas development on the North Slope to Native peoples in southwestern Alaska.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

We re-analyzed waterfowl survey data, with an emphasis on brant, to guide determination of an appropriate no-lease

area. Preliminary results indicate that the draft Preferred Alternative would, on average, protect 56% of molting brant under a no-lease designation. The remaining brant use lakes that: 1) occur on the boundary between the no-lease area and the area available to leasing, 2) occur entirely within the area available for leasing, 3) occur on private land (Cape Halkett) or 4) occur on the boundary between public and private lands. Our analysis also indicates that by enlarging the no-lease zone presented in the draft Preferred Alternative from 213,000 to approximately 296,000 acres, the goal of protecting 90 percent of molting brant is nearly achieved. Although our proposed revision to the boundary of the no-lease area (Figure 1) falls just short of the 90% goal, due largely to the importance of lakes on private lands in the Cape Halkett area to molting geese, it does encompass molting lakes that support, on average, 89 percent of molting brant (Table 1). Our proposal also would protect larger portions of molting greater white-fronted, Canada, and snow geese (Figure 2). The modified boundaries would increase protection of habitats important to spectacled eiders, brood-rearing waterfowl, seaducks, shorebirds, and denning polar bears. Finally, the modified no-lease area would increase protection of calving, migration, and insect-relief habitat used by the Teshekpuk Lake Caribou Herd. **(Comment No. 197619-039)**

Response To: Comment 197619-039

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

The no-lease area proposed under the draft Preferred Alternative would be increased from 213,000 to approximately 296,000 acres to protect molting brant and other trust resources (see Figure 1). **(Comment No. 197619-042)**

Response To: Comment 197619-042

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Teshekpuk Lake and other fish-bearing lakes would be off-limits to surface development. A minimum ¼-mile undisturbed buffer around these lakes would be applied to prevent oil and other hazardous material spills from reaching these largely confined systems. **(Comment No. 197619-043)**

Response To: Comment 197619-043

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Other than approved surveys, non-emergency helicopter or fixed-wing transits over the no-lease zone would be prohibited from June 15 - August 20. **(Comment No. 197619-044)**

Response To: Comment 197619-044

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

The no-surface-occupancy requirements for lease tracts west and south of the current no-lease area would be maintained to protect core calving habitat for the Teshekpuk Lake Caribou Herd. **(Comment No. 197619-045)**

Response To: Comment 197619-045

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

To avoid the potential impacts of increased access in biologically sensitive areas, a roadless design would be required for any development proposed within the existing no-lease and no-surface-occupancy areas of the TLSA. Within the CRSA, roads will be minimized to a single consolidated crossing of the Colville River and CRSA, if necessary. ***(Comment No. 197619-046)***

Response To: Comment 197619-046

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Leasing of tracts within the Colville River Special Area would be deferred until this area has an approved management plan. This is consistent with the recent Northwest NPR-A Final Integrated Activity Plan/EIS, and would protect nesting raptors and passerines. ***(Comment No. 197619-047)***

Response To: Comment 197619-047

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

The no-permanent-facilities buffer adjacent to the Colville River would be expanded from one to two miles to encompass important raptor foraging habitats. ***(Comment No. 197619-048)***

Response To: Comment 197619-048

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Until an approved management plan is completed for the CRSA, aircraft would be restricted to altitudes of at least 1,500 feet AGL within 1/2 mile of cliffs identified as raptor nesting areas from March 15 - August 5. ***(Comment No. 197619-049)***

Response To: Comment 197619-049

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Construction of permanent facilities for exploration would be prohibited. ***(Comment No. 197619-050)***

Response To: Comment 197619-050

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

We propose to protect the identified area by retaining its no-lease status. We point out, however, that by focusing on brant, our recommended modification to the proposed no-lease area would not include all critical caribou habitats,

particularly the important migration corridor east of Teshekpuk Lake. ***(Comment No. 197619CM-013)***

Response To: Comment 197619CM-013

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

Recognizing the irreplaceable nature of the fish and wildlife resources in the Northeast Planning Area, particularly within the TLSA, the Service prefers the protective measures provided in the No Action Alternative. However, should leasing be expanded in the TLSA, we recommend the following modifications to the draft Preferred Alternative to reduce risks to trust resources in the Northeast Planning Area: The no-lease area proposed under the draft Preferred Alternative would be increased from 213,000 to approximately 296,000 acres to protect molting brant and other trust resources. ***(Comment No. 197619CM-016)***

Response To: Comment 197619CM-016

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

Recognizing the irreplaceable nature of the fish and wildlife resources in the Northeast Planning Area, particularly within the TLSA, the Service prefers the protective measures provided in the No Action Alternative. However, should leasing be expanded in the TLSA, we recommend the following modifications to the draft Preferred Alternative to reduce risks to trust resources in the Northeast Planning Area: Teshekpuk Lake and other fish-bearing lakes would be off-limits to surface development. A minimum ¼-mile undisturbed buffer around these lakes would be applied to prevent oil and other hazardous material spills from reaching these largely confined systems. ***(Comment No. 197619CM-017)***

Response To: Comment 197619CM-017

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

Recognizing the irreplaceable nature of the fish and wildlife resources in the Northeast Planning Area, particularly within the TLSA, the Service prefers the protective measures provided in the No Action Alternative. However, should leasing be expanded in the TLSA, we recommend the following modifications to the draft Preferred Alternative to reduce risks to trust resources in the Northeast Planning Area: Other than approved surveys, non-emergency helicopter or fixed-wing transits over the no-lease zone would be prohibited from June 15 - August 20. ***(Comment No. 197619CM-018)***

Response To: Comment 197619CM-018

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

Recognizing the irreplaceable nature of the fish and wildlife resources in the Northeast Planning Area, particularly within the TLSA, the Service prefers the protective measures provided in the No Action Alternative. However, should leasing be expanded in the TLSA, we recommend the following modifications to the draft Preferred Alternative to reduce risks to trust resources in the Northeast Planning Area: The no-surface-occupancy requirements for lease tracts west and south of the current no-lease area would be maintained to protect core calving habitat for the Teshekpuk

Lake Caribou Herd. ***(Comment No. 197619CM-019)***

Response To: Comment 197619CM-019

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

Recognizing the irreplaceable nature of the fish and wildlife resources in the Northeast Planning Area, particularly within the TLSA, the Service prefers the protective measures provided in the No Action Alternative. However, should leasing be expanded in the TLSA, we recommend the following modifications to the draft Preferred Alternative to reduce risks to trust resources in the Northeast Planning Area: To avoid potential impacts of increased access in biologically sensitive areas, a roadless design would be required for any development proposed within the existing no-lease and no-surface-occupancy areas of the TLSA. Within the CRSA, roads would be minimized to a single consolidated crossing of the Colville River and CRSA, if necessary. ***(Comment No. 197619CM-020)***

Response To: Comment 197619CM-020

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

Recognizing the irreplaceable nature of the fish and wildlife resources in the Northeast Planning Area, particularly within the TLSA, the Service prefers the protective measures provided in the No Action Alternative. However, should leasing be expanded in the TLSA, we recommend the following modifications to the draft Preferred Alternative to reduce risks to trust resources in the Northeast Planning Area: Leasing of tracts within the CRSA would be deferred until this area has an approved management plan. This is consistent with the recent Northwest NPR-A Final Integrated Activity Plan/EIS, and would protect nesting raptors and passerines. ***(Comment No. 197619CM-021)***

Response To: Comment 197619CM-021

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

Recognizing the irreplaceable nature of the fish and wildlife resources in the Northeast Planning Area, particularly within the TLSA, the Service prefers the protective measures provided in the No Action Alternative. However, should leasing be expanded in the TLSA, we recommend the following modifications to the draft Preferred Alternative to reduce risks to trust resources in the Northeast Planning Area: The no-permanent-facilities buffer adjacent to the Colville River would be expanded from one to two miles to encompass important raptor foraging habitats. ***(Comment No. 197619CM-022)***

Response To: Comment 197619CM-022

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

Recognizing the irreplaceable nature of the fish and wildlife resources in the Northeast Planning Area, particularly within the TLSA, the Service prefers the protective measures provided in the No Action Alternative. However, should leasing be expanded in the TLSA, we recommend the following modifications to the draft Preferred Alternative to reduce risks to trust resources in the Northeast Planning Area: Until an approved management plan is completed for

the CRSA, aircraft would be restricted to altitudes of at least 1,500 feet AGL within 1/2 mile of cliffs identified as raptor nesting areas from March 15 - August 5. ***(Comment No. 197619CM-023)***

Response To: Comment 197619CM-023

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

Recognizing the irreplaceable nature of the fish and wildlife resources in the Northeast Planning Area, particularly within the TLSA, the Service prefers the protective measures provided in the No Action Alternative. However, should leasing be expanded in the TLSA, we recommend the following modifications to the draft Preferred Alternative to reduce risks to trust resources in the Northeast Planning Area: Construction of permanent facilities for exploration would be prohibited. ***(Comment No. 197619CM-024)***

Response To: Comment 197619CM-024

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: State of Alaska (Comment Letter No. 197620)

In addition to the collaboration process described above, the State requests the following provisions be incorporated in the BLM's Preferred Alternative: Defer leasing in Teshekpuk Lake or make leasing available with the caveat that no permanent oil and gas facilities be allowed on the lake until further analysis is completed regarding spill concerns and other potential effects of construction, operation, and maintenance of drilling islands and causeways on water resources, fish, birds, and mammals. ***(Comment No. 197620-003)***

Response To: Comment 197620-003

The BLM considered your comments during the development of the Final Proposed Action. Leasing of Teshekpuk Lake has been deferred under the proposed action.

Comment From: State of Alaska (Comment Letter No. 197620)

Defer leasing in the Goose Molting Area or make leasing available with the caveat that no permanent oil and gas facilities be allowed in the Goose Molting Area until the conditions set forth in the State's 1998 comments summarized below are met:
1. Goose and caribou disturbance studies, designed and implemented by a joint state, federal, NSB, and industry research and monitoring team are conducted.
2. Technology is advanced and it can be demonstrated that proposed oil and gas activities will not negatively impact molting geese behavior.
3. The consultation [collaboration] process is developed and successfully implemented in conjunction with an NPR-A exploration and development planning process.
4. The Federal Aviation Administration (FAA) and BLM, in consultation with the Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS), develop and implement appropriate helicopter planning and routing restrictions for this area to prevent disturbance during the critical goose molting period. ***(Comment No. 197620-004)***

Response To: Comment 197620-004

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: State of Alaska (Comment Letter No. 197620)

Delete the classification of "No Surface Occupancy" and identify specific surface uses that would be allowed or prohibited in areas of important surface resource values. ***(Comment No. 197620-006)***

Response To: Comment 197620-006

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 2, Alternatives, Section 2.6.1, Definitions, Body of Water or Waterbody, Page 2-12. The definition of body of water or water body states "a lake, river, stream, creek, or pond that holds water throughout the summer and supports a minimum of aquatic life." The definition should be revised to include ephemeral streams that may only contain water for part of the summer season. These streams can serve as important migratory corridors that also provide seasonal rearing habitat for some species of fish such as Arctic grayling. ***(Comment No. 197620-047)***

Response To: Comment 197620-047

We have taken your comment into consideration in finalizing the Preferred Alternative mitigations.

Comment From: Jean and Harold Kolb (Comment Letter No. 197627)

The entire Teshekpuk Lake Surface Protection Area should remain closed to drilling as in the current leasing plan to protect the remarkable wildlife habitat it encompasses. The wetlands, sedge meadows, and waters of the Teshekpuk Lake area are necessary for tens of thousands of molting geese of many species who are flightless and vulnerable in that condition. The area is also used by other wildlife including 45,000 caribou. BLM's Preferred Alternative would reduce protection of Teshekpuk by 75%. It would eliminate nearly all the current wildlife protections and allow permanent gravel roads for exploration as well as construction activities that would infringe on sensitive buffer zones. ***(Comment No. 197627-002)***

Response To: Comment 197627-002

The BLM considered your comments during the development of the Final Proposed Action. See response to comment 197617-072 under topic Special Designation Areas.

Comment From: Tom and Sally Overholt (Comment Letter No. 197629)

We are writing to voice our opposition to the BLM proposal to reduce the size of the Teshekpuk Lake Surface Protection Area from its current size of nearly 858,000 acres to 213,000 acres. The TLSPA encompasses a complex of wetlands that is crucial to thousands of molting geese, a major herd of caribou, and many other wildlife species. The caribou herd is an important resource for subsistence hunters on the North Slope. Oilfield development in this area would negatively impact these animals. We urge you not to reduce the size of the Protection Area. ***(Comment No. 197629-001)***

Response To: Comment 197629-001

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Gerhard Olving (Comment Letter No. 197630)

I understand you are considering reducing the Teshekpuk Lake Surface Protection Area by some 75%! With about 1.4

million acres in the North-eastern Reserve already leased and being explored (for oil and gas), there should be no problem keeping the Teshekpuk Lake surroundings protected in perpetuity. Permitting people with their equipment (trucks, airplanes, drilling gear, etc.) will have a devastating impact on wildlife. ***(Comment No.* 197630-001)**

Response To: Comment 197630-001

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Christiane Raymond (Comment Letter No. 197631)

understand that the Bureau of Land Management (BLM) is proceeding with a proposal to reduce the Teshekpuk Lake Surface Protection Area of the National Petroleum Reserve-Alaska. As a member of National Audubon, Sierra Foothills Audubon in California, and as an avid outdoor enthusiast I am incensed by the BLM's failure to recognize the devastating impact an acreage reduction would have on two of our country's most important and precious resources: our indigenous peoples and wildlife. ***(Comment No.* 197631-001)**

Response To: Comment 197631-001

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

EPA recommends that the BLM develop and analyze a modified Preferred Alternative that incorporates the leasing acreage and No Surface Activity restrictions in Alternative A with a set of revised and improved performance-based stipulations and ROPs. Attachment 2 includes EPA's specific comments and recommendations for improvements to the proposed stipulation and ROPs that are included in the Draft EIS Preferred Alternative. We recommend that the BLM wait to open additional ecologically sensitive land to leasing within the Planning Area until after the new performance-based stipulations and ROPs have been used and their effectiveness has been tested and documented. ***(Comment No.* 197632-004)**

Response To: Comment 197632-004

We have considered your recommendations in developing the final Stipulations. The BLM is confident in its ability to administer oil and gas activities in the Planning Area using the performance-based stipulations and ROPs. BLM strongly believes that performance based mitigation and the greater flexibility it offers to adapt requirements/standards to specific situations and to modify the requirements/standards based on their effectiveness will increase our ability to protect surface resources and subsistence use.

Comment From: Inupiat Community of the Arctic Slope (Comment Letter No. 197635)

To what degree do the Inupiaq people have to tell the Federal Government that we want to protect our lands? It's been stated over and over again that the stipulations set in 1998 should not be changed. We want to protect our lands because if we do not speak out for protection of the lands from where we get our food, we would not be caretakers. The Inupiaq people are stewards of our lands and we want our generations that follow to subsist as we have. ***(Comment No.* 197635-003)**

Response To: Comment 197635-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Inupiat Community of the Arctic Slope (Comment Letter No. 197635)

With No Action Alternatives, we are COMPROMISING our livelihood and subsistence way of life so that there will be oil and gas development that we can live with. With this alternative, we are making sure that the Inupiaq people will continue to subsist with no long-term detriment to our resources. Please take notice that Teshekpuk Lake is the core habitat of what we subsist on. This area supports the caribou, fish, and waterfowl habitats. If the area is disturbed, you have no idea what detrimental effects it will have on our resources in the long run. ***(Comment No.* 197635-004)**

Response To: Comment 197635-004

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Robert Franz (Comment Letter No. 197636)

I feel the DEIS for the Northeast planning area is seriously deficient in many ways. I recognize that some development will take place, but there must be a balance, and that balance was arrived at in the 1998 study, and I do not feel any changes need to take place. I favor Alternative A, which encompasses the 1998 study. ***(Comment No.* 197636-001)**

Response To: Comment 197636-001

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Robert Franz (Comment Letter No. 197636)

The Teshekpuk Lake Area is a very unique and special area, vital to waterfowl, and the Teshekpuk caribou herd. It is also an area of subsistence resources for the native peoples. It is a major wetlands for migrating waterfowl. This area was noted decades ago as being a very special and vital part of the landscape for the interconnected species. This area needs to remain protected. Areas provided for development tend to be areas denied for access to others, including native peoples. ***(Comment No.* 197636-003)**

Response To: Comment 197636-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Robert Franz (Comment Letter No. 197636)

I support Alternative A, as that was what was proposed after a serious study in 1998, and I do not feel things have changed since then. ***(Comment No.* 197636-009)**

Response To: Comment 197636-009

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Mary Ann McCall (Comment Letter No. 197639)

Do not cut the Teshekpuk Lake Surface Area by 75 percent and the size of the no-lease zone by more than half - down to a mere 213,000 acres. Biologists and wildlife professional have made clear that there is no scientific justification for this change, and the small protected area would be grossly inadequate in terms of fish and wildlife protection around Teshekpuk Lake. 1. During July and August, up to 37,000 brant - 30 percent of all Pacific brant - molt in the area north and east of Teshekpuk Lake. 2. Large numbers of greater white-fronted geese molting at the lake are increasing and range as high as 35,000 individuals, about 6 percent of the mid-continental populations, and 3. thousands of Canada and snow geese gather to molt in this unique wetland complex. 4. This area is home to the

Teshekpuk Lake Caribou Herd of 45,000 animals.5. This caribou herd is very important in terms of subsistence harvests by Alaska Natives living on the North Slope. **(Comment No. 197639-002)**

Response To: Comment 197639-002

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Delbert Rexford (Comment Letter No. 197974)

More importantly, I'm charged with the responsibility of protecting the rights of Native allotment owners, townsite lot restricted landowners. There are numerous Native allotment owners both certified, pending, and closed that BLM has not properly adhered to, and yet they want to continue making lands available for lease to the oil and gas industry, not to the benefit of the stakeholders, not to the benefit of the Native community, but only to the benefit of the oil and gas industry, the federal government, and the State of Alaska. I'm speaking in general terms. **(Comment No. 197974-161)**

Response To: Comment 197974-161

We have forwarded your comment to the Conveyances Division of the BLM Alaska State Office.

Comment From: John Garder (Comment Letter No. 197977)

Despite the failure to identify areas needing permanent protection and the lack of scientific evidence that the proposed plan to open up more of the Northeast area to oil and gas development would be minimal, this draft amended IAP-EIS is a rush to approve additional leasing in the western Arctic. The BLM should go back and consider another alternative that protects all the Teshekpuk Lake and Colville River special areas and strengthens monitoring and lease stipulation requirements. At a very minimum, the BLM should adopt a Alternative A, the no-action alternative, which retains current protections for fish and wildlife habitat around Teshekpuk Lake. Thank you. **(Comment No. 197977-088)**

Response To: Comment 197977-088

The Final Preferred Alternative D defers Teshekpuk Lake from oil and gas activities. Please see lease stipulation K-7

Comment From: Charles Brower (Comment Letter No. 197980)

I would like to start off on the comments on the process: The three alternatives presented in the Draft Plan are not a sufficient range of choice. In particular, if BLM has made the decision to convert the existing 79 stipulations into performance-based mitigation measures, then Alternative A is meaningless. **(Comment No. 197980-012)**

Response To: Comment 197980-012

See response to comment 197616-073 under Alternatives, Range of Alternatives, Preferred Alternatives

TOPIC: ALTERNATIVES, RANGE OF ALTERNATIVES, PREFERRED ALTERNATIVES

ISSUE: BIRDS

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

All essential waterfowl habitat within the Teshekpuk Lake Special Area (TLSA) must be protected and remain free of permanent facilities. Continued deferral of tracts northeast of the Lake would protect significant goose molting

habitat. Other critical molting habitat, as well as nesting habitat for a variety of waterfowl, would be placed at risk if additional areas north and east of the Lake were opened to development. ***(Comment No. 196407-008)***

Response To: Comment 196407-008

We recognize the importance of the Northeast Planning Area, specifically the area northeast of Teshekpuk Lake, as important goose molting and other waterfowl habitat. The BLM believes that significant mitigating measures have been included in the final Proposed Action to protect key waterfowl habitat; specifically, see Stipulations K-4 and K-6 (Section 2.6, Stipulations) for a complete description of the stipulations.

TOPIC: ALTERNATIVES, RANGE OF ALTERNATIVES, PREFERRED ALTERNATIVES

ISSUE: CARIBOU

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

All essential habitats of the Teshekpuk Lake Caribou Herd must be protected. Hunters from seven of our villages take animals from the Teshekpuk Lake Caribou Herd, making it the most important herd on the North Slope from a subsistence standpoint. This herd is not habituated to industrial activities, and would likely be displaced from preferred habitat if development is permitted and occurs in areas now closed. The result would be population effects on the herd and significant effects to subsistence harvests. Essential calving habitat around Teshekpuk Lake, insect relief habitat north of the Lake, and the narrow corridors between the Lake east to the Kogru River and the Lake northwest to Smith Bay that provide the only routes to calving and insect relief habitats, must remain free of permanent facilities. ***(Comment No. 196407-007)***

Response To: Comment 196407-007

We recognize the importance of the Northeast Planning Area and its significance to the Teshekpuk Lake Caribou Herd (TLCH). The BLM believes that significant mitigating measures have been included in the final Proposed Action to protect key caribou habitat; specifically, see Stipulations K-5, K-6, K-9, and K-10 (Section 2.6, Stipulations) for a complete description of the stipulations.

TOPIC: ALTERNATIVES, RANGE OF ALTERNATIVES, PREFERRED ALTERNATIVES

ISSUE: PERFORMANCE VS. PRESCRIPTED

Comment From: Robert Franz (Comment Letter No. 197636)

There needs to be a balance of protections and those are lacking in Alternative B, which increases development, and Alternative C which essentially opens everything up for exploitation without meaningful safeguards. ***(Comment No. 197636-002)***

Response To: Comment 197636-002

The BLM considered your comments during the development of the Final Proposed Action.

TOPIC: ANILCA

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The finding regarding the cumulative case requires BLM to hold hearings in the potentially affected communities as specified in ANILCA Section 810 (a)(1) and (2), and to make three determinations required by section 810 (a)(3)(A),(B), and (C). The three determinations are: 1) that such a significant restriction of subsistence is necessary, consistent with sound management principles for the utilization of public lands; 2) that the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition; and 3) that reasonable steps will be taken to minimize adverse impacts to subsistence uses and resources resulting from such actions.

If BLM intended that the public hearings on the Draft Amended IAP/EIS also serve as the community hearings required under ANILCA Section 810, we believe that the public was not made sufficiently aware that the North Slope hearings recently conducted were meant to serve that dual function. Even if proper formal notice had been given, BLM's failure to highlight at the hearings themselves the findings of the Section 810 analysis and the additional requirements imposed by a finding of a significant restriction of subsistence uses was contrary to the most basic intent of the ANILCA requirement. In order to elicit from subsistence users the focused testimony necessary to enable BLM to meaningfully consider appropriate factors and make required determinations, the full Section 810 analysis process must be explained. It has not yet been, and our subsistence users have not yet been appropriately engaged by BLM in the analysis.

We urge BLM to formally describe the Section 810 analysis process, present information obtained in this process, describe the method(s) used to evaluate this information and derive findings, and reveal the resulting finding(s) from the three steps in the Section 810(a)(3)(A),(B), and (C) Subsistence Determinations in meetings with our affected communities, and then release all this information for public review and comment before preparing the Final IAP/EIS. Preparing and presenting this documentation, and allowing full public discussion of all alternatives based on the Section 810 review before concluding the EIS process, would generate the best and most meaningful findings, and would to some extent allay the substantial concerns of our residents that apparent protections could be lost in the implementation of a final amended management plan by BLM. **(Comment No. 196407-041)**

Response To: Comment 196407-041

The Bureau of Land Management is concerned by the statement that the combined Draft EIS Meetings and ANILCA 810 Hearings held in August in North Slope communities were not fully understood by the public-at-large. As such, additional ANILCA 810 Hearings have been scheduled and will be held in November 2004 in the potentially affected communities of Anaktuvuk Pass, Atqasuk, Barrow and Nuiqsut. These hearings will be structured to fully explain BLM's ANILCA 810 Policy and Process, and will include detailed descriptions of each of the findings for the three alternatives and the cumulative case, as well as the rationale behind the findings. It is the hope of the BLM that these additional hearings will not only serve to gather additional substantial input from residents regarding subsistence that may have been missed because of the apparent misunderstanding, but will also reinforce the strong commitment that the BLM has to minimizing the effects of land-use planning decisions to subsistence.

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that no area be studied for further land management restrictions, including wilderness designation, wild & scenic rivers, etc. The ANILCA "no more" clause does not allow such studies and the recent Secretary's decision prohibits such studies unless the Congressional delegation and the Governor agree and so request. **(Comment No. 196937-003)**

Response To: Comment 196937-003

There are no wilderness designations or new wild and scenic river areas being considered in this amendment process.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

Since BLM is unable to demonstrate the effectiveness of mitigation measures necessary to bring NPRA leasing within the parameters of ANILCA and FLPMA, the agency is not in a position to recommend an expansion of industrial activities in the Northeast NPRA.

2. The mitigation measures adopted as part of the 1998 Northeast NPRA ROD are not adequate to meet the requirements of ANILCA and FLPMA. ***(Comment No. 197605-030)***

Response To: Comment 197605-030

The BLM believes that we have met the requirements of ANILCA and the relevant components of FLPMA. Section 802 (16 U.S.C. 3112) of ANILCA states the policy of subsistence management and use as: "consistent with sound management principles, and the conservation of healthy populations of fish and wildlife, the utilization of the public lands in Alaska is to cause the least adverse impact possible on rural residents who depend upon subsistence uses of the resources of such lands; consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for each unit established, designated, or expanded by or pursuant to titles II through VII of this Act, the purpose of this title is to provide the opportunity for rural residents engaged in a subsistence way of life to do so." [Note that the National Petroleum Reserve-Alaska was not established, designated or expanded pursuant to titles II through VII of the Act; it was established by its own legislation—the Naval Petroleum Reserves Production Act of 1976.]

To this end, the BLM is committed to "cause the least adverse impact possible" while still allowing for designated use of the National Petroleum Reserve-Alaska, namely "an expeditious program of competitive leasing of oil and gas in the National Petroleum Reserve in Alaska" [Public Law 96-514—Dec. 12, 1980; 42 USC 6508 (which is the Act of Congress that opened the petroleum reserve)]. The 79 stipulations established in the 1998 NE Plan, as well as the adaptive management stipulations and required operating procedures proposed in the current NE Plan Amendment are examples of the BLM adhering to the requirement to cause the least impact possible, as required in ANILCA.

Additionally, the Naval Petroleum Reserves Production Act of 1976 specifically states that "(2) the provisions of sections 202 and section 603 of the Federal Lands Policy and Management Act shall not be applicable to the reserve" (42 USC Sec. 6508).

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

As already noted in these comments, BLM, in its 1998 ROD disregarded the adverse impacts to our communities' critical bowhead subsistence hunt, including vital interactions between the caribou and bowhead hunts, and the need for consultation and coordination with the AEWC.' In general, BLM has given little or no weight to the potentially devastating impacts that can result from the cumulative effects of OCS oil and gas development and the offshore components of NPRA development. This is a glaring omission of the 1998 Decision and one that BLM must rectify before it can adequately consider additional Northeast NPRA leasing.

c. BLM has not established that adverse impacts to subsistence resources can be minimized, as required by Section 810 of ANILCA. ***(Comment No. 197605-034)***

Response To: Comment 197605-034

We have considered offshore development in the cumulative analysis of this document, please see Section 4.6.5.7, Federal Lease Sales Considered in this Cumulative Effects Analysis, and also see Section 4.6.9.10, Threatened and Endangered Species – Bowhead Whales, for a detailed discussion of cumulative impacts.

Section 810 of ANILCA requires that three final determinations be made if there is found to be a significant restriction to subsistence: A) that such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of public lands; B) that the proposed activity will involve the minimal

amount of public lands necessary to accomplish the purpose of such use, occupancy, or other disposition, and C) that reasonable steps will be taken to minimize adverse effects upon subsistence uses and resources resulting from such actions. "Reasonable steps" include the creation and required application of mitigation measures, such as the stipulations and required operating procedures. Additional mitigation measures will be solicited from the potentially affected communities at the required ANILCA Hearings on how the BLM can further minimize adverse impacts on subsistence.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

In making this argument BLM does not even attempt to address the tests created by Congress in ANILCA and FLPMA. Rather, it proposes a tortured and self-serving rationalization, saying in effect that "the damage will occur anyway" so adding to it is justified. This is a complete misapplication of the cumulative effects analysis, leading to a result that is in direct contravention of the purposes for which that analysis was created. Moreover, in making this rationalization, BLM conveniently fails to note that the "impacts on surrounding lands" are due in major part to actions by BLM and its sister agency at the Department of the Interior, MMS. Taking this amazingly arrogant proposition to its logical conclusion, BLM would interpret the congressional directives of ANILCA as saying that the agency can justify an action threatening significant impacts to subsistence on the grounds that the agency has already allowed such impacts to occur. ***(Comment No. 197605-037)***

Response To: Comment 197605-037

BLM does not believe we have misapplied the cumulative affects analysis in addressing ANILCA 810 requirements, nor are we justifying current proposals based on past actions.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

The second basis on which BLM sought to justify its Decision in 1998, and the only one on which the 1998 Decision in fact can be justified, consistent with federal law, is the promise of extensive mitigation measures including prohibitions and restrictions on oil and gas activities, and provisions for extensive consultation with the local communities. As pointed out by BLM in the current DEIS and noted earlier in these comments, sufficient time has not passed for these mitigation measures to be developed and implemented so that the affected parties can see whether they will be sufficient to minimize impacts to our subsistence uses of the NPRA, as guaranteed by ANILCA and FLPMA. ***(Comment No. 197605-039)***

Response To: Comment 197605-039

The BLM does not use an impact analysis to justify a decision for leasing or any other activity. The purpose of an

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

Thus, the timing of a decision to increase leasing in the Northeast NPRA is premature. Furthermore, as discussed, it is vital to the success of BLM's proposed mitigation measures that the agency show itself to be a trustworthy steward of public lands, and an expansion of leasing at this time would demonstrate the precise opposite. Taken together, these factors virtually guarantee that a decision by BLM to go forward with additional leasing at this time will result in severe adverse impacts to our communities' subsistence uses of the public lands and renewable resources of the Northeast NPRA. Such a decision therefore will place BLM in violation of its responsibilities for protecting and preserving subsistence uses in the NPRA, as directed in FLPMA and ANILCA. 3. BLM cannot even begin to evaluate the extent of impacts from oil and gas development in the Northeast NPRA without first undertaking substantial research and coordination, as recommended by the NRC Committee. ***(Comment No. 197605-040)***

Response To: Comment 197605-040

The BLM believes that we have met the requirements of ANILCA and the relevant components of FLPMA. Section

802 (16 U.S.C. 3112) of ANILCA states the policy of subsistence management and use as: "consistent with sound management principles, and the conservation of healthy populations of fish and wildlife, the utilization of the public lands in Alaska is to cause the least adverse impact possible on rural residents who depend upon subsistence uses of the resources of such lands; consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for each unit established, designated, or expanded by or pursuant to titles II through VII of this Act, the purpose of this title is to provide the opportunity for rural residents engaged in a subsistence way of life to do so." [Note that the National Petroleum Reserve-Alaska was not established, designated or expanded pursuant to titles II through VII of the Act; it was established by its own legislation—the Naval Petroleum Reserves Production Act of 1976.]

To this end, the BLM is committed to "cause the least adverse impact possible" while still allowing for designated use of the National Petroleum Reserve-Alaska, namely "an expeditious program of competitive leasing of oil and gas in the National Petroleum Reserve in Alaska" [Public Law 96-514—Dec. 12, 1980; 42 USC 6508 (which is the Act of Congress that opened the petroleum reserve)]. The 79 stipulations established in the 1998 NE Plan, as well as the adaptive management stipulations and required operating procedures proposed in the current NE Plan Amendment are examples of the BLM adhering to the requirement to cause the least impact possible, as required in ANILCA.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Under the ANILCA subsistence analysis (Appendix B), there is no mention of possible impacts to brant and other waterfowl as subsistence resources for rural residents, especially in western Alaska communities. Nearly 70 percent of all banded brant recaptured at Teshekpuk Lake during their molt originated at colonies on the Yukon-Kuskokwim Delta (Bollinger and Derksen 1996). ***(Comment No. 197610-073)***

Response To: Comment 197610-073

Both the Draft and the Final ANILCA 810 analysis include impacts to brant and other waterfowl. The analysis in the Draft IAP/EIS uses the term "birds" which includes brant and other waterfowl. The Final ANILCA 810 analysis has addressed the concern from the Bethel community regarding impacts specific to brant.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

NEPA requires the exploration and objective evaluation of reasonable alternatives.73 Section 810 of ANILCA also requires the consideration of alternatives.74 That's alternatives - plural. The BLM has already decided that performance-based measures will be implemented in the Northeast NPR-A, and it has confined its planning process to only developing performance-based measures. How then can there be alternative mitigation packages that are considered and analyzed in the Amended Draft EIS or the Section 810 analysis? Cramming an already-made decision through this process by narrowly defining the decision to be made and then providing only one alternative that is consistent with that decision is not in compliance with the letter or the spirit of NEPA or ANILCA. See e.g. State of Wyoming v. United States Department of Agriculture, 277 F.Supp.2d 1197, 1122 (D. Wyo. 2003). See also International Snowmobile Manufacturers Assoc. v. State of Wyoming, 2004 U.S. LEXIS 1796 (D. Wyo. Feb. 10, 2004)(prejudged political decision coupled with the lack of a hard look in the Final EIS leads to the conclusion that there is a substantial likelihood that agency decision is arbitrary and capricious.) ***(Comment No. 197616-081)***

Response To: Comment 197616-081

The ANILCA 810 Analysis presented in Appendix B discussed the impacts of each of the three identified alternatives in the Northeast Amendment, as well as the cumulative case. Contrary to the comment, above, Alternative A would retain the 79 stipulations that are currently in place in the northeast; only Alternatives B and C would incorporate performance-based stipulations similar to those present in the NW Plan.

Following the ANILCA 810 Process, hearings were held in the potentially affected communities of Anaktuvuk Pass, Atqasuk, Barrow and Nuiqsut. The purpose of these hearings was threefold: 1) to describe BLM's ANILCA Policy and Process; 2) to present the Findings of the ANILCA 810 Analysis; and 3) to obtain comments, concerns, additional information and potential mitigation measures from the residents of the potentially affected communities. No final

decisions, including with regard to the final mitigation package, have been made in the Draft EIS.

The Draft IAP/EIS has provided a full range of alternatives and through this NEPA process has evaluated those alternatives, and compared the effectiveness of the prescriptive and performance-based mitigations. Evaluating the performance based mitigation measures within an Alternative (A) that does not provide leasing in or around the most sensitive areas of this planning area is of little value in terms of assessing the effectiveness of mitigations. Alternative C in the amended Draft IAP/EIS makes 100% of the Northeast Planning Area available for oil land gas leasing and it is under this Alternative (C) that oil and gas development would most likely occur; thereby, providing analysts an opportunity to assess or evaluate the effectiveness of the proposed performance-based stipulations and required operating procedures. The BLM strongly believes that the Performance-based stipulation and ROP package is superior to the Prescriptive approach used in Alternative A in the 1998 ROD; the adaptability and flexibility provided by the Performance-based strategy allows the BLM to make decisions based on new information and project-specific details. This allows mitigations to be adaptable to the specific needs of the area of potential impact from oil and gas activities. While we believe that the Performance-based are a better way to provide protection, we have made no final decisions.

This comment (197616-081) also has a response under topic NEPA Process.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Not only is the Section 810 ANILCA analysis of the alternatives worthless because the BLM has a pre-ordained outcome, but that analysis also uses the NEPDG's recommendation that the President direct the secretary to consider additional leasing in the Northeast NPR-A in its evaluation of the availability of other lands. See e.g. Amended Draft EIS, Appendix B, p. B-9. This is problematic since there are no other lands that meet the purpose, but the BLM still concludes that other lands that it administers are either too remote to develop economically or have a low potential for recoverable oil. ***(Comment No. 197616-084)***

Response To: Comment 197616-084

According to BLM ANILCA 810 Policy, "When making an evaluation in the availability of other lands, two aspects must be considered: 1) Are the other lands available in terms of timing, ownership, and designation, and 2) Are the other lands available for the purposes sought to be achieved by the proposed action." The ANILCA 810 analysis of the availability of other lands attempts to explain that the proposed actions (i.e., Alternatives A through C—making available or not making available additional land in the Northeast National Petroleum Reserve-Alaska for oil and gas leasing) are to achieve the purpose of fulfilling our mandate from the Secretary of the Interior and the President, and are therefore the rationale for answering question 2, above. The BLM acknowledges that there are no other lands that meet these criteria. The last statement in this part of the ANILCA 810 analysis concerning other lands that are managed by the BLM answers the question posed in number 1, above, and is required.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Is the AO going to do a Section 810 analysis when a proposal gets made for such a facility? What about public input? The simple answer is that there apparently would be no public input. This provision essentially lets the oil industry say that if they can do something cheaper with a permanent facility, they can do so. What about environmental standards? Apparently cost counts most, since the language is not qualified. How much sense does it make to strictly regulate the size and location of development pads when an oil company can sashay in and get approval for an exploration-related pad or road just by showing that it's cheaper to do it that way? This is outrageous. ***(Comment No. 197616-119)***

Response To: Comment 197616-119

An ANILCA 810 analysis would be required under the scenario you describe. In fact, ANILCA 810 analyses are required for any action requiring a decision in the National Petroleum Reserve-Alaska. If an oil company proposed to construct a permanent facility for exploration, a subsequent environmental analysis (either and EA or an EIS) and an ANILCA 180 evaluation would be required by law.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Additionally, the ANILCA Section 810 analysis says that the differences between the 1998 NE NPR-A ROD and Alternative B (other than opening additional areas in the Teshekpuk Lake Area to surface occupancy and leasing) would not reduce the level of protection afforded. This needs to also be corrected and the analysis needs to reflect the differences between the 1998 NE NPR-A ROD and Alternative B. See Amended Draft EIS, Appendix B, p. B-8. ***(Comment No.* 197616-129)**

Response To: Comment 197616-129

The ANILCA 810 analysis states that there are two differences between the No Action Alternative (1998 ROD) and the Draft Preferred Alternative (B) that would potentially cause substantial affects on subsistence resources or their use. As stated on page B-6 of the DIAP/EIS " the availability of additional land for oil and gas leasing from within the Teshekpuk Lake Special Area, and the removal of the No Surface Occupancy zone south of Teshekpuk Lake. Other changes, such as updating the stipulations to conform to an adaptive management approach, would not reduce the level of protection afforded, as the ROPs would still specify the parameters by which the lessee/permittee would operate."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

We see this again in the ANILCA Section 810 analysis where it says: Stipulation H [SIC]181 and ROPs H-1 and H-2 would be the primary mitigation measures in place to ensure adequate access to traditional hunting areas by the residents of Nuiqsut, Barrow, and Atqasuk in the Teshekpuk Lake Special Area. (Emphasis added). ***(Comment No.* 197616-186)**

Response To: Comment 197616-186

The consultation required by Stipulation H: Subsistence Consultation for Permitted Activities consists of consultation between the applicant (meaning the seismic company, or the oil company, etc.) and nearby communities, not by the BLM. This consultation would allow the communities to set parameters to the actual on-the-ground operator; for example "you need to update us daily by calling the city office to tell us where you are located and how long you will be there." Then it is responsibility of the applicant to inform the BLM what decision with regard to operating were made during this consultation (see ROP H-1).

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The Amended Draft EIS almost says enough about sociocultural and subsistence impacts to make it look as though it is analyzing the proposed changes to the management of the Northeast NPR-A. But, when reviewed a little closer, we see that there are conclusions and information, but basically no analysis. This is not the hard look at these impacts that NEPA requires. Additionally, the BLM suggests that it can mitigate impacts to subsistence activities with a consultation requirement. That is just wishful thinking, and the Amended Draft EIS and ANILCA Section 810 Analysis need to be revised to reflect this. ***(Comment No.* 197616-191)**

Response To: Comment 197616-191

The consultation requirement is one way to mitigate impacts to subsistence, especially with regard to accessing subsistence resources. If subsistence hunters know in advance where oil and gas activities are taking place, they can plan their hunting trip around this information. Other mitigation measures that are in place to protect fish and wildlife resources and habitat, also serve to protect subsistence, in that they provide for the continued viability of subsistence resources. The ANILCA 810 evaluation was edited to better convey this assertion. There is analysis, as far as best data allows, in the subsistence and sociocultural environmental consequences sections. The NEPA standard is "best available data." In general, the comments speak to the lack of current research correlating impacts that the author is experiencing to oil and gas development.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Proposed Action Violates ANILCA § 810: Inadequate ANILCA § 810 Finding The ANILCA 810 analysis in Appendix B of the draft IAP/EIS is fundamentally flawed. There is no scientific rationale to support BLM's conclusion that access and impacts to subsistence resources would be minimal if the agency removes 75% of the Teshekpuk Lake Surface Protection Area. (draft IAP/EIS at B-10). **(Comment No. 197617-158)**

Response To: Comment 197617-158

The ANILCA 810 analysis uses all of the information presented in the main text of the NE Amendment. This information is written by individual resource specialists (i.e., wildlife biologists, fisheries biologists, hydrologist, etc.) and is grounded in the best science available at the time, as prescribed by NEPA. The conclusion that impacts to subsistence resources would be minimal follows the assertion that impacts to fish and wildlife resources would be minimal

Comment From: Environmental Coalition (Comment Letter No. 197617)

The basis for the conclusions reached in the Analysis under the various exploration and development drat IAP/EIS Alternatives is unreliable. The level to which subsistence resources will be degraded by oil and gas exploration and development is inextricably linked to the impact these activities will have on fish and wildlife resources both throughout the planning area and at sites specifically used for subsistence. The Analysis does not even include all of the directly affected subsistence communities nor does it consider the additional cumulative impact to subsistence from the September 2003 Mineral Management Service offering of the adjacent 9.1 million acres in the Beaufort Sea. As discussed previously, the draft IAP/EIS fails to adequately assess the impact of oil and gas exploration and development on these resources, and on subsistence usage, on a site-specific basis. This failure to adequately disclose and analyze impacts to subsistence on a site-specific basis also violates NEPA. An adequate assessment of impacts would likely conclude that proposed activities under all Alternatives that allow any exploration or development activities will, in fact, significantly restrict subsistence uses without regard to the cumulative case. In addition, given the uncertainty of information available concerning impacts on many wildlife species, BLM simply cannot justify any conclusion other than that a significant restriction may occur under each exploration and development Alternative. The ANILCA § 810 Finding for the Preferred Alternative in the draft IAP/EIS at B.2.2. is deficient. **(Comment No. 197617-159)**

Response To: Comment 197617-159

The directly affected subsistence communities of Anaktuvuk Pass, Atqasuk, Barrow, and Nuiqsut were considered in the analysis and specifically discussed in Section 3.4.2, Subsistence. Please see Section 4.7.5.7 for a discussion of federal lease sales considered in the cumulative effects analysis which includes information regarding the 2003 Minerals Management Service Lease Sale 186.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Because the draft IAP/EIS fails to properly conclude that the action alternatives will pose by themselves a threat of substantial restrictions of subsistence activities, the hearings that BLM says it intends to hold will not meet ANILCA's requirements. BLM cannot hold fair hearings if it fails to inform the affected public that it's proposed action standing alone will substantially restrict subsistence activities. **(Comment No. 197617-161)**

Response To: Comment 197617-161

It is not true that the BLM cannot hold hearings if the affected communities are not informed that the "proposed action standing alone will substantially restrict subsistence activities." The finding of "may significantly restrict subsistence use" for any alternative including the cumulative case triggers the requirement that hearings be held in the potentially affected communities.

Following the ANILCA 810 Process, hearings will be held in the potentially affected communities of Anaktuvuk Pass, Atqasuk, Barrow and Nuiqsut. The purpose of these hearings is threefold: 1) to describe BLM's ANILCA Policy and Process; 2) to present the Findings of the ANILCA 810 Analysis; and 3) to obtain comments, concerns, additional information and potential mitigation measures from the residents of the potentially affected communities. In presenting the findings, if the communities disagree with our conclusions, they have the opportunity to state their opposition. This is one of the objectives of the Hearing process.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Based on information in the draft IAP/EIS, we do not believe the BLM can, at the conclusion of this process, reasonably make the findings required by the second tier of the section 810 process. BLM cannot establish that this intrusion into these key areas is necessary, and the Secretary has already determined that the 1998 decision uses the minimal amount of public lands. Moreover, the IAP/EIS fundamentally fails to demonstrate that the new proposed mitigation measures are sufficient or will be effective. ***(Comment No. 197617-162)***

Response To: Comment 197617-162

Congress established the area as the National Petroleum Reserve – Alaska (PL 94-258) and further directed BLM to conduct an expeditious program of competitive oil and gas leasing (PL 96-514); in 2002 the President's National Energy Policy Development Group recommended that the President direct the Secretary of the Interior to consider further lease sales in the National Petroleum Reserve and that such consideration should include areas not currently leased within the northeast corner of the Petroleum Reserve. In carrying out its responsibilities BLM has complied with the requirements of section 810 of ANILCA.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS fails to specify the size, frequency and timing of sales, making such a determination all but impossible. The draft IAP/EIS does not contain sufficient justification for a conclusion that reasonable mitigation measures would be taken to minimize the effects on subsistence uses. Finally, as previously discussed, the draft IAP/EIS has completely failed to demonstrate that this particular leasing program is necessary at this time. Thus, as a matter of both NEPA and ANILCA analysis, at the present time there is an insufficient basis for resolving the second tier requirements of ANILCA 810. ***(Comment No. 197617-163)***

Response To: Comment 197617-163

The timetable for future lease sales is discussed in Section 1.7.1 in "Requirements for Further Analysis"; also see response to comment 197617-163 under ANILCA.

Comment From: Stan Senner (Comment Letter No. 197978)

One of the most interesting sections of the Environmental Statement is the analysis of impacts on subsistence harvests, and this is an analysis required under ANILCA, and I just noted, I read it on the plane as I flew in here today, that that analysis of subsistence impacts doesn't mention the word brant, and it doesn't mention impacts on YK Delta communities. The only discussion, the only substantive discussion in that section is caribou with reference to Nuiqsut, Barrow, Atqasuk and Anaktuvuk Pass. So there's again a huge inadequacy in that environmental statement by the failure to mention brant and YK Delta communities. ***(Comment No. 197978-097)***

Response To: Comment 197978-097

There is some discussion of brant and Y-K Delta in regards to lead poisoning in the Final IAP/EIS.

TOPIC: BASIC ASSUMPTIONS

Comment From: Nancy Ebbert (Comment Letter No. 019869)

Dear Planning Team, as a taxpayer and a concerned citizen, I have studied the USGS findings regarding the reserves in Alaska---and, as you know, the analysis indicated that much of the petroleum there is not economically recoverable. And, further, that which is economical to produce would only last the lower 48 a grand total of six months. My conclusion, like that drawn by thousands of other taxpayers is that it is not worth the irreversible damage to our wildlife and our lands. ***(Comment No. 019869-001)***

Response To: Comment 019869-001

The commenter is correct in that the amount of oil that is projected to be available under the Preferred Alternative would meet U.S. energy needs for approximately 6 months. If a gas pipeline is built from the North Slope to gas export terminals in southern Alaska, or across Canada to the lower 48 states, abundant gas resources in the Planning Area would also be available to meet the nation's energy needs. The Preferred Alternative has been developed to help reduce the nation's dependence on foreign energy sources and provide economic benefits to the State of Alaska and its residents, while utilizing stipulations and ROPs to minimize impacts to the environment.

Comment From: Steven Mueller (Comment Letter No. 033673)

Please do not proceed with the proposed amendment to the oil and gas leasing plan for the Northeast National Petroleum Reserve Environmental Impact Statement. Before seeking oil in the Northeast National Petroleum Reserve our nation needs to partake in conservation measures that reduce the use of petroleum. Using reserves at this time is not patriotic nor is it in the interest of future generations. ***(Comment No. 033673-001)***

Response To: Comment 033673-001

The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National Petroleum Reserve-Alaska. As discussed on page 4-13 of the Draft IAP/EIS, the process of leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale and the start-up of production from any discovered oil fields in the National Petroleum Reserve-Alaska. Alternative energy programs are outside the scope of this IAP/EIS as they would not meet the stated objective of fulfilling the President's Energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska."

Comment From: Kathi Griffin (Comment Letter No. 039278)

Why not explore more renewable sources of energy instead of depleting further ones that are becoming, if we can believe the oil corporations, scarce? We do not need to do more damage. ***(Comment No. 039278-003)***

Response To: Comment 039278-003

See response to comment 033673-001 under Basic Assumptions

Comment From: Paul Kriescher (Comment Letter No. 051844)

It would be a huge mistake to risk the internationally significant ecological resources of Teshekpuk Lake for a short-term supply of energy, especially when we know that the United States cannot drill its way to energy independence. The estimated 800,000 barrels of oil/day that will come from this area of the Reserve would more easily be met through energy efficiency enhancements in cars. Specifically, raising CAFE standards for cars to 40 mpg would save more than 1.5 million barrels a day within 6 to 8 years (according to the Union of Concerned Scientists) while also creating a beneficial lure for people to buy new cars (further stimulating the economy) because of the significant savings they would see at the pump. ***(Comment No. 051844-004)***

Response To: Comment 051844-004

See response to comment 033673-001 under Basic Assumptions

Comment From: Christine Bucklin (Comment Letter No. 059528)

I would like to add that scientists have foretold that any oil obtained from this area will only provide a small 6 month supply. If this area is destroyed for such a small amount of oil, Americans will be shamed and embarrassed in the world yet again by the decisions of our government. We need to force industry to find alternative options before they have destroyed all the beautiful and ecologically necessary lands of our country. The only way this can be done is by saying NO to drilling in Alaska. I have flown over the oil fields of upper AK and they are a secretive ugly wasteland, a shame on the American people. Please don't let this happen again. Thank you. ***(Comment No. 059528-005)***

Response To: Comment 059528-005

See response to comment 033673-001 under Basic Assumptions

Comment From: Sarah Ryker (Comment Letter No. 059760)

This is a comment on the proposed amendment to the oil and gas leasing plan under the Northeast National Petroleum Reserve EIS. According to the BP Statistical Review of oil and gas resources, current gas prices are driven not by lack of immediate supply but by concern over affairs in the Middle East. This finding makes it unlikely that opening up the Western Arctic Reserve to drilling would have any effect on fuel prices. ***(Comment No. 059760-001)***

Response To: Comment 059760-001

This IAP/EIS addresses proposed amendments to the Integrated Activity Plan for the Northeast National Petroleum Reserve-Alaska. As an agency of the federal government, BLM is responsible for implementing the President's National Energy Policy to President's Energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The mandate further states that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska." In accordance with the President's energy policy, BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing. The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the

Comment From: Santiago Miro (Comment Letter No. 063180)

Your decision should be based on facts, rather than political pressures. There is no substantiated proof that the fuel "reserves" in Alaska will contribute significantly to the US's energy independence. ***(Comment No. 063180-001)***

Response To: Comment 063180-001

The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National Petroleum Reserve-Alaska. As discussed on page 4-13 of the Draft IAP/EIS, the process of leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale and the start-up of production from any discovered oil fields in the National Petroleum Reserve-Alaska. In accordance with the President's energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska," BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing.

Comment From: Aaron Gilliam (Comment Letter No. 086081)

Studies that both you and I are aware of have been conducted showing that the amount of oil in the Arctic National Wildlife Refuge would be insignificant at best to fixing our imminent oil crisis. ***(Comment No. 086081-001)***

Response To: Comment 086081-001

See response to comment 063180-001 under Basic Assumptions

Comment From: Jane Fasullo (Comment Letter No. 114822)

And all of this for what reason? Increasing our oil supply while doing nothing to create a significant reduction in demand? Giving us a few months of oil which will take billions of dollars and at least five years to generate? FOOLISH behavior. Opening these lands for oil exploration cannot be justified and the destruction caused by the move will take centuries to correct (if the damage can be repaired at all). Instead of opening up more of the area to leasing and oil and gas development, the BLM should provide a more balanced, science-based approach to energy development and environmental protection by permanently protecting the Teshekpuk Lake and Colville River Special Areas and strengthening monitoring and lease stipulation requirements. ***(Comment No. 114822-006)***

Response To: Comment 114822-006

The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National Petroleum Reserve-Alaska. As discussed on page 4-13 of the Draft IAP/EIS, the process of leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale and the start-up of production from any discovered oil fields in the National Petroleum Reserve-Alaska. In accordance with the President's energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska," BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing. Designation of an area as a Special Area recognizes that significant surface resources are present and that during oil and gas exploration, the area should be managed to assure maximum protection of identified surface values to the extent consistent with the requirements of the Naval Petroleum Reserve Production Act. The BLM will provide maximum protection for surface

resources through mitigation measures developed through this NEPA process, continued consultation and coordination with federal and state resource agencies, and further environmental evaluation of proposed oil and gas activities. The development and refinement of measures to protect unique cultural, natural, fish and wildlife, and scenic and historical values is an ongoing process that does not end with this NEPA process or with adoption of an Integrated Activity Plan. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted.

Comment From: Thomas Matthews (Comment Letter No. 116072)

America's proven oil reserves amount to just 3 percent of the world s oil reserves, but the US is responsible for 25 percent of the world s oil consumption each year. Opening the Teshekpuk Lake area to drilling will not reduce America s dependency on foreign oil. Nor will it reduce the price of gasoline. **(Comment No. 116072-005)**

Response To: Comment 116072-005

See response to comment 063180-001 under Basic Assumptions

Comment From: Thomas Matthews (Comment Letter No. 116072)

The oil and gas industry fails to use all the leases it is given. Last year, the industry used only 71 percent of the leases made available to it. **(Comment No. 116072-006)**

Response To: Comment 116072-006

It is true that industry may not test all of its leases. This is very common in exploration programs because information acquired after the lease sale will high-grade some leases while condemning others. Industry needs a sufficient inventory of leases to schedule efficient exploration programs that could last throughout the term of the leases (10 years). New technologies emerge that enable industry to identify prospects that could not be mapped along geologic trends at the time of the lease sale. With a sufficient inventory of leases, evolving exploration technologies, and drilling experience in an area, industry is in a better position to make discoveries that turn into commercial fields.

Comment From: John Kozub (Comment Letter No. 122798)

Allowing industries to fowl this natural resource will not solve our country's energy crisis- conservation of energy and alternative sources are the real answers, and neither requires injury to our most precious public lands. This area was set aside for emergencies only, and we have no such emergency before us now. The impact to nature's balance in these areas would far exceed the value of the oil extracted; the real motivation can only be politics and profit; it must be your first priority to protect these lands from special interests, whether supported by elected officials or not, for the benefit of the future and of the citizens who are the true owners of all public lands. **(Comment No. 122798-002)**

Response To: Comment 122798-002

In 1980, Congress authorized "an expeditious program of competitive leasing of oil and gas" in the National Petroleum Reserve-Alaska (P.L. 96-514, Dec. 12, 1980). Section 102 of the Federal Land Policy and Management Act (FLPMA) requires that BLM manage all of its lands from a multiple-use perspective. Oil and gas leasing is a legitimate use of BLM-managed lands and a specific use designated for the National Petroleum Reserve-Alaska since it was established in 1923. The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each

has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National Petroleum Reserve-Alaska. As discussed on page 4-13 of the Draft IAP/EIS, the process of leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale and the start-up of production from any discovered oil fields in the National Petroleum Reserve-Alaska. In accordance with the President's energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska," BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing.

Comment From: Jaime Palter (Comment Letter No. 137486)

Dear Planning Team, as a natural scientist, I have major concerns about the plan to open the Northeast National Petroleum Reserve to drilling. Working in a geology department, I have a unique understanding about the costs and benefits of this type of program. In this reserve, it is clear that the costs of drilling far outlay the benefits. **(Comment No. 137486-001)**

Response To: Comment 137486-001

Northern Alaska is certainly a high-cost area for operations, and many companies share your opinion about the economic viability of the area. These companies do not participate in lease sales in the National Petroleum Reserve-Alaska. Other companies, however, are interested in exploration in the National Petroleum Reserve-Alaska and have demonstrated that they can operate profitably in this environment. Companies are attracted to the area because it is one of the richest petroleum basins in the U.S. A small field by North Slope standards (50 million barrels) is huge compared to fields currently being discovered in other areas of the country. Companies consider the high risk/reward ratio when adding frontier areas, such as the National Petroleum Reserve-Alaska, to their corporate strategies. The three sales held since 1999 in the National Petroleum Reserve-Alaska have attracted $222 million in bonus bids for leases. Apparently, some companies believe that profitable operations can be conducted in this area.

Comment From: Julian Powers (Comment Letter No. 144995)

DO NOT DRILL IN ALASKA for the following reasons:1. It would require 6-10 years to get oil delivered.2. The predicted amount of oil would be minimal considering thus usage, therefore is not a effective solution.3. Native Alaskan ecology would be irreparably damaged.4. Oil companies would require taxpayer subsidies and I objector supporting the oil companies.5. Global warming is causing the tundra to melt so much that current Alaskan oil operations are considering working in the winter and NOT working in the summer.6. Current pipeline foundations are sinking due to global warming so the long-term expense of maintaining a pipeline would-be tremendous.7. Increasing the auto/truck mileage requirements would do FARMORE than drilling in Alaska, -- and would be permanent, i.e., AFTER the planned Alaskan oil would be depleted.8. Global warming mitigation requires significantly decreased use of fossil fuels. Surely within the next 6 years decision makers will take actions to reduce the global warming looming disaster. IF so, drilling for more oil is not a responsible use of taxpayer money. **(Comment No. 144995-001)**

Response To: Comment 144995-001

The BLM has considered your comments in developing the Final Preferred Alternative. We are also providing a brief response to each of your points. 1. It is correct that 10 years or more would likely pass between a lease sale and the start-up of production from any discovered oil fields. 2. The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. 3. The analyses in the 1998 Northeast National Petroleum Reserve-

Alaska IAP/EIS, the 2003 Northwest National Petroleum Reserve-Alaska IAP/EIS, the 2004 Alpine Satellite Development Plan Final EIS, and this Draft IAP/EIS do not support the conclusion that Native Alaskan ecology would be irreparably damaged by drilling in the National Petroleum Reserve-Alaska. 4. No federal subsidies for oil companies operating in the National Petroleum Reserve-Alaska are under consideration. 5. Melting of the tundra in summer is the normal and natural cycle on the North Slope. The coastal plain becomes a vast wetlands. This is why oil and gas activities and other operations using heavy equipment are historically done during the winter months when the tundra is frozen. Also, bird species of concern and caribou are not present on the coastal plain during the winter months. In fact, BLM does not allow many activities to occur until freezing of the tundra reaches a certain depth. 6. The BLM is unaware of any documented occurrences of sinking pipeline foundations on the North Slope. 7. Conservation strategies will play a role in meeting future energy demands. Alternative energy programs are outside the scope of this IAP/EIS as they would not meet the stated objective of fulfilling the President's Energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." 8. As stated in the response to point #7, alternatives to fossil fuels are beyond the scope of this IAP/EIS. Drilling in the National

Comment From: Mark J. Fiore (Comment Letter No. 153527)

Second, the oil we get from fully functional Western oil fields is not cost effective when we factor in externality costs. For those of you who have not read Hawkings Ecology of Commerce, let me clarify. When all costs associated with the loss of wildlife and global warming plus oil spills are factored in just about THE ONE PLACE that is a no brainer not to destroy is a place like the ARCTIC WILDERNESS. ***(Comment No.* 153527-002)**

Response To: Comment 153527-002

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: John Strasenburgh (Comment Letter No. 185987)

Please, name for me one credible scientific study since 1998 that discounts the vital importance of Teshekpuk Lake Special Area to migratory bird nesting, rearing, molting, pre-migration staging. Or one that discounts the importance of this Special Area to the Teshekpuk caribou. I don't believe you can. ***(Comment No.* 185987-007)**

Response To: Comment 185987-007

The area is very important to fish and wildlife species as documented in the IAP/EIS and the document does not

Comment From: Sharon Wyberg (Comment Letter No. 186677)

These risks are simply not acceptable, and neither are they necessary. The energy that could be developed here would take ten years to reach market and would represent scant days of our national use. These lands are simply more valuable to the public protected as wilderness. ***(Comment No.* 186677-008)**

Response To: Comment 186677-008

The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National Petroleum Reserve-Alaska, which was designated for this use in 1923. As discussed on page 4-13 of the Draft IAP/EIS, the process of leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale

and the start-up of production from any discovered oil fields in the National Petroleum Reserve-Alaska.

Comment From: Sarah McGiffert (Comment Letter No. 187460)

America's proven oil reserves amount to just 3 percent of the world's oil reserves, but the US is responsible for 25 percent of the world's oil consumption each year. Opening the Teshekpuk Lake area to drilling will not reduce America's dependency on foreign oil. Nor will it reduce the price of gasoline. **(Comment No. 187460-006)**

Response To: Comment 187460-006

The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National Petroleum Reserve-Alaska. As discussed on page 4-13 of the Draft IAP/EIS, the process of leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale and the start-up of production from any discovered oil fields in the National Petroleum Reserve-Alaska. In accordance with the President's energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska," BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing.

Comment From: Sarah McGiffert (Comment Letter No. 187460)

The oil and gas industry fails to use all the leases it is given. Last year, the industry used only 71 percent of the leases made available to it. **(Comment No. 187460-007)**

Response To: Comment 187460-007

See response to comment 116072-006 under Basic Assumptions

Comment From: Robert Davison (Comment Letter No. 194259)

The BLM's stated premise for its proposal to revise the 1998 plan for the Northeast NPR-A is that it "has conducted various scientific studies on the biological resources of the area in cooperation with the North Slope Borough, the State of Alaska, and other federal agencies," and that "[i]nformation gained since the completion of the NE plan has led BLM to conclude that it is appropriate to consider amending it." WMI is not aware of any information that would lead to such a conclusion. The BLM should substantiate its statement in the 2003 scoping notice by providing this information to the public and demonstrating how it supports the stated conclusion. **(Comment No. 194259-003)**

Response To: Comment 194259-003

The BLM is re-evaluating the decisions made in the 1998 ROD as a result of the President's NEPDG recommendation that the President direct the Secretary of Interior to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska" and that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska."

Comment From: June Huyett Thomas (Comment Letter No. 195059)

Degradation of this area for oil exploration will not provide this country energy independence. It will at best only be a short term fix with huge long term environmental impacts that will be irreversible. ***(Comment No. 195059-005)***

Response To: Comment 195059-005

The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National Petroleum Reserve-Alaska. Subsequent to the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the analyses in the 2003 Northwest National Petroleum Reserve IAP/EIS and the 2004 EIS on the Alpine Satellite Development Plan indicate that oil and gas leasing, exploration, development, and production activities with appropriate mitigation measures can occur in the National Petroleum Reserve-Alaska without significant impacts to wildlife. Operational experience with exploration in the National Petroleum Reserve-Alaska supports that conclusion. The development and refinement of measures to protect unique cultural, natural, fish and wildlife, and scenic and historical values is an ongoing process that does not end with this NEPA process or with adoption of an Integrated Activity Plan. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted.

Comment From: Elizabeth McCloskey (Comment Letter No. 196086)

It would be a huge mistake to risk the internationally significant ecological resources of Teshekpuk Lake for a short-term supply of energy, especially when we know that the United States cannot drill its way to energy independence. The amount of oil that "could" be found in the current Teshekpuk Lake Special Area is insignificant compared to the daily use of oil in the United States, but the ecological value of the current Special Area is irreplaceable. ***(Comment No. 196086-008)***

Response To: Comment 196086-008

The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is

Comment From: Michael R. North (Comment Letter No. 196264)

Page 4-28, paragraph 2, last sentence. If production from this planning area may be delayed 5-10 years as a result of limitations on pipeline capacity, and if it is BLM's expectation that plans have a life of 10-15 years, what is the justification for recommending modifications to the 1998 ROD so early into the Plan's life? Alternative A seems to best address the current realities of the situation as well as meet BLM policy regarding life of plans. ***(Comment No. 196264-014)***

Response To: Comment 196264-014

Subsequent to the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the analyses in the 2003 Northwest National Petroleum Reserve IAP/EIS and the 2004 EIS on the Alpine Satellite Development Plan indicate that oil and gas leasing, exploration, development, and production activities with appropriate mitigation measures can occur in the National Petroleum Reserve-Alaska without significant impacts to wildlife. Operational experience with exploration in the National Petroleum Reserve-Alaska supports that conclusion. The BLM believes it is an appropriate time to reconsider the stipulations and ROPs in the National Petroleum Reserve-Alaska and has made a decision to study and consider such a change via this NEPA process. Also subsequent to the 1998 Plan, the National Academy of Sciences National Research Council, published the report "Cumulative Effects of Oil and Gas Activities on Alaska's North Slope" March 2003. The information and conclusions of the National Research Council's report are considered in the cumulative analysis in this IAP/EIS. It is appropriate under both the Federal Land Policy and Management Act (FLMPA) and the National Environmental Policy Act (NEPA) to reconsider an Integrated Activity Plan and/or an environmental analysis when new information that may change the plan or the environmental conclusions becomes available.

Comment From: Jim DiPeso (Comment Letter No. 196404)

There are broader issues at stake. Weakening protections for Teshekpuk Lake and associated wetland ecosystems would make little appreciable difference in lessening U.S. dependence on foreign oil, even if all 2 billion barrels of estimated 'technically recoverable' petroleum reserves are economically recoverable as well. ***(Comment No.*** **196404-004)**

Response To: Comment 196404-004

Subsequent to the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the analyses in the 2003 Northwest National Petroleum Reserve IAP/EIS and the 2004 EIS on the Alpine Satellite Development Plan indicate that oil and gas leasing, exploration, development, and production activities with appropriate mitigation measures can occur in the National Petroleum Reserve-Alaska without significant impacts to wildlife. Operational experience with exploration in the National Petroleum Reserve-Alaska supports that conclusion. The Teshekpuk Lake area has been designated as a Special Area in recognition that significant surface resources are present and that during oil and gas exploration, the area should be managed to assure maximum protection of identified surface values to the extent consistent with the requirements of the Naval Petroleum Reserve Production Act (NPRPA). As required under Section 7 of the Endangered Species Act, BLM is consulting with the U.S. Fish and Wildlife Service to assure protection of listed species and their critical habitats. The development and refinement of measures to protect unique cultural, natural, fish and wildlife, and scenic and historical values is an ongoing process that does not end with this NEPA process or with adoption of an Integrated Activity Plan. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted. The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National

Comment From: Jim DiPeso (Comment Letter No. 196404)

In the context of the global oil market, the petroleum that would be extracted by weakening Teshekpuk Lake protections would have minuscule impacts on oil prices or on altering the ratio of domestic to foreign oil supplied to the U.S. market. ***(Comment No.*** **196404-005)**

Response To: Comment 196404-005

See response to comment 196404-004 under Basic Assumptions

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-6, Watercraft Use: it should be specified under what conditions "non-recreational airboat use would be allowed on all streams, lakes, and estuaries." **(Comment No. 196407-094)**

Response To: Comment 196407-094

Airboat use for non-recreational activities, including wildlife surveys, research, and oil and gas activities would be allowed during the summer months.

Comment From: Conoco Phillips (Comment Letter No. 196557)

From the above discussion it is easy to understand why increased leasing in the Northeast Planning Area must begin in 2005 as recommended in order to maximize the likelihood that additional discoveries will continue to be found -- discoveries which are needed to provide the continued employment and economic benefits upon which Alaska and its rural populations depend. It is critical to bring additional discoveries on line in order to maximize production from existing fields and to ensure efficient use of existing infrastructure. **(Comment No. 196557-020)**

Response To: Comment 196557-020

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Conoco Phillips (Comment Letter No. 196557)

BLM's risked mean estimate of conventionally recoverable oil reserves in the Northeast Planning Area is 5.27 billion barrels of oil and 16.41 trillion cubic feet of gas or 58 and 44 percent, respectively, of the total risked mean estimate for the entire Petroleum Reserve. Id. See DEIS at 3-16 and 3-17. First, these data show that the resource potential in the Petroleum Reserve is not uniformly distributed, but is focused in the Northeast Planning Area. Second, the resource potential in the Northeast Planning Area itself is not uniformly distributed and instead is focused on a narrow band of land in and around the coast. As the data summarized below point out, "the highest conventionally recoverable and economic potential lies in the northern third of the Artic coastal plain below the Barrow Arch. This structural ridge has been a focus for regional oil and gas exploration, and all currently producing fields on the North Slope are located on or near the Barrow Arch."17 Historical exploration experience over the last 15 years agrees with the BLM statement and clearly shows that the greatest potential for commercial hydrocarbon occurrences in the Petroleum Reserve exists within 40 miles from the crest of the Barrow Arch. **(Comment No. 196557-021)**

Response To: Comment 196557-021

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 4-60, last paragraph before Placement of Gravel Fill. In this and similar sections, the assumption that half the ice pads would be multi-year ice pads is erroneously high. CPAI knows of only 3 multi-year (insulated) ice pads in the history of North Slope oil and gas activities. Also see page 4-175. **(Comment No. 196557-093)**

Response To: Comment 196557-093

The text related to multi-year ice pads has been deleted and revisions to the number of acres impacted have been made in Sections 4.3.3, 4.4.3, and 4.5.3.

Comment From: Conoco Phillips (Comment Letter No. 196557A2)

The U.S. economy will benefit significantly from additional domestic oil production. State, local and federal government will also directly benefit economically from additional oil exploration and development in the Petroleum Reserve via bonus bids, rentals, and royalties. In addition, incremental oil production from the Petroleum Reserve will support continued operation of the existing fields on the North Slope and efficient use of pipeline infrastructure, and will provide additional jobs. ***(Comment No. 196557A2-006)***

Response To: Comment 196557A2-006

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Conoco Phillips (Comment Letter No. 196557A2)

The Greatest Oil and Gas Potential in the Petroleum Reserve is Near The Coast. The highest conventionally recoverable and economic potential lies in the northern third of the Artic coastal plain on or near the Barrow Arch. This structural ridge has been a focus for regional oil and gas exploration, and all currently producing fields on the North Slope are located on or near the Barrow Arch. ***(Comment No. 196557A2-007)***

Response To: Comment 196557A2-007

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Polly Dyer (Comment Letter No. 196714)

NEED FOR OIL: The oil situation in the United States of America is not critical. It is premature to even consider breaching the Northern Petroleum Reserve at this time. The USA NEEDS to, FIRST, adopt, and enforce, conservation efficiency in all motor vehicles and all other equipment using petroleum products. The current consumption of petroleum is notate a crisis nor has it reached a level of being the last resort for delving into whatever oil MAY BE in potential Alaska Northwest reserves. BLM should, in good conscience, propose conservation efficiency BEFORE advancing further inroads. It is ESSENTIAL foray and all Environmental Impact Statements to emphasize implementing conservation of petroleum through efficiency FIRST. ***(Comment No. 196714-001)***

Response To: Comment 196714-001

See response to comment 196086-008 under Basic Assumptions

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

We also are concerned that the development and production scenario used in the DEIS (e.g., Table 4-3) underestimates the infrastructure that ultimately will be present if alternatives B or C are selected, especially with oil prices at present levels. To understand the basis of this concern, one need only look at the Alpine field as originally proposed and compare that with the growing number and extent of satellite fields, including connecting roads and pipelines, now proposed or being developed. ***(Comment No. 197610-064)***

Response To: Comment 197610-064

It is impossible to precisely predict where, when, and how much oil and gas will ultimately be produced from a new area. Geologic and economic information constantly change to make any estimates uncertain. That is why we use ranges of values instead of single values for analysis. We base our assumptions on rational interpretations of all available data and realistic projections of current trends. The true level of development will not be known for decades.

The production and development scenarios for all of the alternatives are considered to be optimistic estimates of recoverable petroleum resources. We assume that 100% of the available (unrestricted), commercially viable resources will be found and developed by industry—although the pools are undiscovered at the present time. This is an optimistic assumption (or conservative from an environmental impact standpoint) because industry rarely allocates enough funds to completely explore an area, and industry typically develops only the most profitable prospects. Oftentimes, marginal projects are not funded for development because they do not measure up to higher corporate standards for investment. Realistically, we believe that the scenarios for future production and associated infrastructure could be somewhat over-estimated rather than underestimated.

Regarding the Alpine project, our estimates of reasonably foreseeable development include 250 MMbbl for future production from in a number of discoveries in the adjacent area (Western Group; table IV-12, NW EIS) that could become satellites to the Alpine infrastructure. In the 1998 FEIS for NE NPRA, we estimated that 600 MMbbl will be developed in that area if oil prices average $30 per barrel. Although a few small discoveries have been identified in NPRA and the adjacent Colville Delta, and oil prices are now much higher than $30 per barrel, it appears that this previous 850 MMbbl estimate (250 + 600 MMbbl) overstates the level of anticipated development. However, this means that our environmental analysis is conservative with respect to future adverse impacts.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Since there is no new science in favor of changing the management of the Northeast NPR-A, and there have not been advances in the best available technology, what's to justify the amendment of the 1998 NE NPR-A EIS/IAP and ROD? There are other claimed justifications urged by the BLM, but they are similarly deficient. **(Comment No. 197616-033)**

Response To: Comment 197616-033

The BLM often reviews agency Management Plans (IAPs and RMPs) when new information or mandates are being addressed. The 1998 Northeast IAP/EIS proposed amendment is in response to Congressional and Presidential directives. In November 2000, Congress passed, and President Clinton signed, the Energy Policy and Conservation Act Amendments of 2000 (EPCA). EPCA directed the Secretary of the Interior, in consultation with the Secretaries of Energy and Agriculture, to conduct an inventory of oil and natural gas resources beneath federal lands and to identify the extent and nature of any restrictions or impediments to the development of these resources. In 2002, the President's National Energy Policy Development Group recommended that the President direct the Secretary of the Interior to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska" and that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska."

Results from oil exploration conducted in or near the Planning Area suggest that oil reserves in the Planning Area may be greater than originally thought in 1998. Little exploration work had been conducted in the Northeast National Petroleum Reserve-Alaska prior to 1998. Since then, 14 exploration wells have been drilled on leases acquired in 1999. Additional exploration and development drilling has been conducted in the Alpine field, which is adjacent to the Northeast National Petroleum Reserve-Alaska, and was first discovered in 1994. Portions of the Alpine field extend into the Northeast National Petroleum Reserve-Alaska.
Exploration studies suggest that the number and size of oil and gas deposits may be greater than was known in 1998. For instance, the reserve potential for the Alpine field was estimated to be 365 million barrels (MMbbl) in 1998. More recent exploration studies indicate a reserve potential of 500 MMbbl, which would make the Alpine field one of

the largest fields in Alaska.

The BLM is also considering modifying the 1998 stipulations so that they are more performance-based rather than prescriptive-based and to eliminate from the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS those stipulations that relate to actions that are the responsibility of agencies other than the BLM. In addition, the BLM

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The Amended Draft EIS says that if such a discovery were to occur in the Teshekpuk Lake Special Area then a compromise might be reached on mitigation. Amended Draft EIS p. 4-35. But that's just it, compromising on mitigation will provide less protection to subsistence species and to our subsistence activities. We aren't going to get back to the same level of protection for the Teshekpuk Lake Special Area that we have today. If this planning process and the planning process that we are currently going through for the Alpine Satellites are any indication of what we can expect in the future, the possibilities are not promising that there will be compromised mitigation measures with the BLM or with the industry that provides the level of protection to subsistence activities that we find acceptable. ***(Comment No.* 197616-190)**

Response To: Comment 197616-190

The statement appears in the section entitled "Introduction and Basic Assumptions for the Environmental Consequences Assessment" and in that context it is saying that for analysis we did not want to assume that no requirements would be set aside or lessened in some way. This does not mean that any requirements in fact will be set aside but we intended that by assuming it could happen we would avoid understating (or criticism that we have understated) the level of development.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The evaluation of potential impacts from oil development activities in the draft IAP/EIS is based upon a series of proposed development scenarios that are incomplete and unrealistic when evaluated in the context of existing development in the region. As a result, the nature and extent of potential direct, indirect and cumulative impacts are significantly understated. While BLM has acknowledged the proposed actions for the Northeast Planning Area are of a level of significance to warrant a full NEPA review, BLM has failed to address the NEPA requirements for such an analysis in this document. A generic discussion of resources and potential impacts like that contained in the draft IAP/EIS cannot suffice as the required site-specific analysis. ***(Comment No.* 197617-007)**

Response To: Comment 197617-007

The Draft Amendment IAP/EIS (DEIS) fully satisfies the project-specificity requirement of NEPA. Chapter 3, Description of the Environment, of the DEIS provides detailed, project-specific information about the environment that would be affected by the various alternatives, including the physical, biological, socio-economic and cultural resources in the planning area. Summarizing existing scientific studies and surveys conducted on each resource in the planning area, Chapter 3 and its accompanying maps presents in-depth information regarding the different soil and vegetation types and their locations, climate, air quality and surface and ground water resources in the planning area. Detailed scientific information is also provided regarding the various fish, bird, marine and terrestrial mammal, and endangered and threatened species, their known locations, the time of year present and their concentrations in the planning area during the year and during different life stages. For example, the DEIS discusses prime molting, nesting and brood-rearing areas for birds; calving, insect relief and wintering areas for caribou; and polar bear denning sites; etc. Human communities, their socio-economic and ethnic composition, uses of the land, transportation corridors and the importance of subsistence in the planning area are also described and illustrated on maps. Specific information about known historic, paleontological and cultural resources of the planning area is discussed, as well as information about wild and scenic rivers and the varied scenic, visual, recreational and wilderness resources in the planning area. Information received from public comments on the DEIS has been incorporated into the Final Amended IAP/EIS where appropriate. The project-specific information in Chapter 3 provides the basis for the detailed and analysis of direct, indirect, and cumulative environmental impacts in Chapter 4. In Chapter 4, reasonable exploration and

development scenarios are described in detail for each alternative. These scenarios are based on known information about the oil and gas potential of the planning area and existing industry technology. The scenarios used in the DEIS are the same kinds of scenarios utilized in the final 1998 Northeast IAP/EIS and commonly used in many places by various agencies. Applying the scenarios under each alternative to the project-specific information from Chapter 3 about the varied resources in the planning area, environmental analysts predict the potential environmental impacts of projected leasing, exploration and development on different resources in the planning area under each alternative.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Petroleum Operations - Timing. This section should provide timelines showing what activities are expected during development and production throughout each month of the year, so that the environmental effects on wildlife and human communities and subsistence can be more clearly understood. The draft IAP/EIS should make clear that oil production activities on the North Slope take place throughout the year, particularly air and road transportation access to the oil fields, and the production of oil. ***(Comment No. 197617-044)***

Response To: Comment 197617-044

The scenarios offered in this document are plausible, but speculative, views of the future. Trying to predict the exact timing of future activities is highly speculative because of changing economic conditions that influence industry actions. A general seasonal timetable for non-oil and -gas related activities is given in Table 4-1 and discussed in Section 4.2.1.1. A general timetable for a typical development project similar to the Alpine field is given in Table 4-2. Typical schedules for exploration, development, and production activities are discussed on a seasonal level in Section 4.2.1.2. Briefly, exploration is expected to largely occur in winter months (December to May) at sites scattered throughout the area. Development (construction) activities are also expected to occur in winter because of transportation feasibility. Production operations (including well drilling and oil production) would occur year-round.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Exploration. This section is incomplete and inaccurate. It does not reflect the scope of activities allowed for exploration of oil and gas exploration outline in the proposed stipulations. And in some instances there are direct contradictions. For instance, there is no mention of the gravel airstrips and connecting roads authorized by Lease Stipulation D-2. Further the draft IAP/EIS claims exploration will be conducted entirely in the winter months (draft IAP/EIS at 4-14) ending April 1 yet Lease Stipulation K-5b Teshekpuk Lake Caribou Habitat Area allows exploratory drilling May 20 to August 20. Why is the 1200 foot buffer removed around subsistence cabins and what rationale was provided, if any, to the North Slope communities? The draft IAP/EIS must clearly explain these changes to activities allowed for exploration and adequately evaluate the subsequent increased direct, indirect and cumulative impacts particularly since the agency and industry often claim there is no impact from exploration. ***(Comment No. 197617-045)***

Response To: Comment 197617-045

The potential for construction of permanent facilities to carry out exploratory drilling has been included in Section 4.2.1.2 of the Final Amended IAP/EIS, and a discussion of potential impacts associated with this activity has been provided for each resource area under the action alternatives. Exploratory drilling would be allowed only from current production pads or platforms sited within a lake body from May 20 through August 20 in the TLCH to minimize impacts to caribou. Reference to this activity has been included in Section 4.2.1.2, and the potential for effects to caribou from drilling during this period is discussed for the action alternatives. An estimated 70 to 100 shelter cabins are found on lands administered by the BLM in the National Petroleum Reserve – Alaska. Under ROP H-2, the Authorizing Officer for the BLM may prohibit seismic work up to 1,200 feet of any known, long-term, cabin or

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM has consistently argued that there was significant new biological information driving this amendment process. According to the June 23, 2003 Federal register notice inviting scoping comments "BLM has conducted various scientific studies on the biological resources of the area ....information gained since the completion of the plan has

led BLM to conclude that it is appropriate to consider amending it." "We've learned a lot during the past four years," Alaska BLM Director said in the press release announcing the proposed changes to the 1998 ROD. "We know that we can safely explore this area without significant impact to sensitive wildlife and subsistence resources. We also believe that we can develop critical hydrocarbon resources in a manner that protects these same values." In our scoping comments we asked BLM to provide the public with the specific scientific information on which it was proposing to weaken protections or overturn limitations in the 1998 ROD, protections which are in themselves already insufficient to meet the requirements of National Petroleum Reserve Production Act of 1976.To this day, BLM has failed to provide that information except in the most general and subjective terms. We are not aware of any new information that has been analyzed since 1998 that would justify weakening the protections now in place in the Northeast Planning Area. Audubon Alaska's August 2004 comments on this draft Amended IAP/EIS detail the scientific failings of the document and are hereinafter incorporated by this reference. ***(Comment No. 197617-070)***

Response To: Comment 197617-070

We do not believe that our proposed approach in updating the mitigations for protection of the biologically sensitive resources of the Northeast planning area is insufficient. On the contrary, we believe that the Performance-based approach is as protective if not more than the 1998 ROD 79 prescriptive stipulations. The adaptability and flexibility provided by the Performance-based strategy allows the BLM to make decisions based on new information and project-specific details. This allows mitigations to be adaptable to the specific needs of the area of potential impact from oil and gas activities.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Page 5, Summary of Impacts: The second bullet box notes that the No Action Alternative would keep 56% of the high-oil potential area off limits or encumbered by surface-occupancy restrictions. It should be noted that, even with the surface restriction, about 60% of the no- surface-occupancy area has been leased, suggesting industry's willingness to invest in the area and confidence in its ability to develop the resources beneath these tracts. Similarly, about 230,000 acres in the high-oil potential area, most not encumbered by the surface restriction, were offered but not leased in previous lease sales. A more complete and balanced discussion of the leasing in this area is needed in the Executive Summary. (This should also be noted in the Introduction section at page 1-5, paragraph 1 .) ***(Comment No. 197618-008)***

Response To: Comment 197618-008

A discussion of leasing activities in the Planning Area is found in Section 3.2.5.2 of the Draft Amended IAP/EIS. A discussion of development scenarios in the Planning Area is found in Section 4.2.1.2 (page 4-33). Both sections have been revised to include the information provided by the commenter.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Section 4.2.1.2, Oil and Gas Exploration and Development Activities, Differences in Activity Levels for Leasing Alternatives. Page 4-36. This section discusses how the total economic resource potential of the planning area is reduced by objective (area deletions and buffers) and by subjective (cost of mitigation) factors for each of the alternatives at low, medium, and high price scenarios. Costs of mitigation are subjectively assessed at 20 to 30 percent. Costs of subsistence use protection are assessed at an economic resource potential reduction of 10 percent. There needs to be a discussion presented in this section regarding what information served as the basis for these assessments. A clear understanding of the methods and criteria used to make the reduction calculations to the economic resource potential under the various alternatives is important to assessing the true extent of potential development under each scenario. ***(Comment No. 197620-072)***

Response To: Comment 197620-072

The application of resource reduction attributable to costs of mitigation and subsistence are less subjective when viewed from the standpoint of resource distribution and play economics. Probabilistic estimates indicate that most of

the oil (around 65 percent) will be found in Alpine-sized accumulations (128 to 512 MMbbl) (Attanasi 2003). Stand-alone fields less than that size range (about 30 percent of the resource) have lesser probability of being developed, especially because of the difficulty in providing the necessary infrastructure needed for production and transportation of the oil in areas of overlapping setbacks, buffers, and designated pipeline corridors. Small accumulations (30-40 MMbbl) close to existing infrastructure have a greater chance of being developed than similar-sized or larger accumulations in more remote areas, but it is difficult to predict in advance how much resource would be recoverable from satellite developments. Unless tied to a larger development, the cost of facilities for a 30 MMbbl field may be more than double than for a 128 MMbbl field. Based on the foregoing, the costs of mitigation generally equates to that portion of the oil resources in smaller accumulations (30 percent) that have lower probability of being recovered unless tied to larger developments.
Reference: Attanasi, E. 2003. Economics of Undiscovered Oil in Federal Lands on the National Petroleum Reserve. US Geological Survey Open-File Report 03-44, January 2003.

Comment From: John Schoen (Comment Letter No. 197975)

Las year, the Alaska Chapter of The Wildlife Society stated that they were unaware of new scientific information published since '98 regarding Teshekpuk wildlife and the Society recommended retaining the Teshekpuk Lake Surface Protection Area. ***(Comment No. 197975-097)***

Response To: Comment 197975-097

The BLM believes that there is new information since the 1998 ROD that should be considered through this amendment process; however, we did not state nor do we believe that oil and gas activities can be conducted with "no impacts". In fact the EIS process is conducted because there is a potential for significant impacts from the proposed action. It is through the EIS process that we develop mitigation to minimize the potential impacts to the area and its resources. As stated numerous times throughout this document, this agency cannot abrogate its responsibilities to take the appropriate actions necessary to protect any resource of concern in the National Petroleum Reserve-Alaska.
The Teshekpuk Lake Special Area is protected under all of the General Required Operating Procedures as well as all of the project-specific lease K stipulations. We believe that this presents a valid balance of protection while providing limited access for oil and gas activities within the National Petroleum Reserve-Alaska.

TOPIC: BASIC ASSUMPTIONS

ISSUE: ENERGY CONSERVATION

Comment From: Christine Kulis (Comment Letter No. 197624)

I am writing you to urge you to reconsider the proposal to reduce the size of the Teshekpuk Lake Surface Protection Area from 857,859 acres to only 213,000 acres. The Federal government should start putting its dollars into developing fuel efficient cars and alternate energy sources rather than allowing businesses to search for oil reserves in environmentally sensitive areas. It is shameful the way oil industry controls land management in this country. ***(Comment No. 197624-001)***

Response To: Comment 197624-001

Subsequent to the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the analyses in the 2003 Northwest National Petroleum Reserve IAP/EIS and the 2004 EIS on the Alpine Satellite Development Plan indicate that oil and gas leasing, exploration, development, and production activities with appropriate mitigation measures can occur in the National Petroleum Reserve-Alaska without significant impacts to wildlife. Operational experience with exploration in the National Petroleum Reserve-Alaska supports that conclusion. The Teshekpuk Lake area has been designated as a Special Area in recognition that significant surface resources are present and that during oil and gas exploration, the area should be managed to assure maximum protection of identified surface values to the extent consistent with the requirements of the Naval Petroleum Reserve Production Act (NPRPA). As required under Section

7 of the Endangered Species Act, BLM is consulting with the U.S. Fish and Wildlife Service to assure protection of listed species and their critical habitats. The development and refinement of measures to protect unique cultural, natural, fish and wildlife, and scenic and historical values is an ongoing process that does not end with this NEPA process or with adoption of an Integrated Activity Plan. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted. Alternative energy programs are outside the scope of this IAP/EIS as they would not meet the stated objective of fulfilling the President's Energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The BLM has considered your comments in developing the Final Preferred Alternative.

Comment From: P. Matthew Shudtz (Comment Letter No. 197637)

The limited resources expected to be discovered by adoption of Alternative B cannot justify the additional environmental impact of this plan. According to the Draft Amended IAP/EIS, Alternative B will create additional impact to water quality, water resources, air quality, soils, birds, fish, mammals, cultural resources, and every other area of concern. These impacts have the potential to cause permanent damage to the local environment, all for a possible supply of an additional 100-day supply of oil. Particularly disconcerting is the potential impact to the Teshekpuk Lake. ***(Comment No. 197637-003)***

Response To: Comment 197637-003

See response to comment 196404-004 under Basic Assumptions

TOPIC: BASIC ASSUMPTIONS

ISSUE: MOLTING GEESE

Comment From: State of Alaska (Comment Letter No. 197620)

Issues to Address Regarding Molting Geese and Development Activities The goose molting area is a network of narrow upland ridges between large lake basins. Oil and gas leasing must proceed on the assumption that surface access is necessary for exploration and that oilfield development, although uncertain in size and density, will result. For the most part, exploration and drilling during winter is benign to geese, provided that habitats are not damaged. ***(Comment No. 197620-042)***

Response To: Comment 197620-042

This is true and is reflected in the analyses in the EIS.

TOPIC: BASIC ASSUMPTIONS

ISSUE: NEW STUDIES, INFORMATION, OR TECHNOLOGY

Comment From: Ornithologists (Comment Letter No. 197606)

More recently, BLM (2003) stated: BLM has conducted various scientific studies on the biological resources of the area in cooperation with the North Slope Borough, the State of Alaska and other federal agencies. Information gained since the completion of the NE plan [referring to the original plan in 1998] has led BLM to conclude that it is

appropriate to consider amending it. Unfortunately, we are not aware of any new studies that would lead to a scientifically-defensible conclusion that the harmful effects of oil and gas activities in and around the goose molting north and east of Teshekpuk Lake can be avoided or mitigated. Only last year the National Research Council (200316) concluded: If development moves into the Teshekpuk Lake area of the National Petroleum Reserve-Alaska, molting waterfowl could be adversely affected, especially brant. ***(Comment No. 197606-009)***

Response To: Comment 197606-009

The BLM believes that there is new information since the 1998 ROD that should be considered through this amendment process; however, we did not state nor do we believe that oil and gas activities can be conducted with "no impacts". In fact the EIS process is conducted because there is a potential for significant impacts from the proposed action. It is through the EIS process that we develop mitigation to minimize the potential impacts to the area and its resources.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

We are particularly concerned about the Teshekpuk Lake Caribou Herd, molting geese, and nesting water- and shorebirds within this unique and sensitive portion of the Arctic Coastal Plain. There is no new scientific evidence indicating that the size of the Teshekpuk Lake Surface Protection Area can be reduced without jeopardizing biological and subsistence resources, and we find that there is strong consensus within the scientific community that current protections as defined in Alternative A should be maintained. ***(Comment No. 197610-004)***

Response To: Comment 197610-004

This agency cannot abrogate its responsibilities to take the appropriate actions necessary to protect any resource of concern in the National Petroleum Reserve-Alaska. The Teshekpuk Lake Special Area is protected under all of the General Required Operating Procedures as well as all of the project-specific lease K stipulations. We believe that this presents a valid balance of protection while providing limited access for oil and gas activities within the National Petroleum Reserve-Alaska.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

In October 2003 scoping comments on proposed revisions to the Northeast NPR-A plan, Audubon specifically requested that BLM provide documentation of new biological and other studies indicating that oil and gas leasing could be expanded in what is now the TLSPA without jeopardizing biological and subsistence resources. The DEIS failed to provide this documentation.

Response To: Comment 197610-019

See response to comment 197975-097 under Basic Assumptions

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The Amended Draft EIS does not incorporate the new studies or the new technology that we were led to believe would be forthcoming during the scoping process for this Amended Draft EIS. The unspoken but real motivation driving BLM's actions here is a change in Presidential policy. ***(Comment No. 197616-004)***

Response To: Comment 197616-004

The BLM does have a policy direction from the President's National Energy Policy Development Group to consider further lease sales in the National Petroleum Reserve-Alaska. See Purpose and Need, Section 1.3 of the Final IAP/EIS.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

New technology was another reason advanced by the BLM during scoping for the amendment of the 1998 NE NPR-A EIS/IAP and ROD.25 The Amended Draft EIS provides an "update" to the 1998 NE NPR-A EIS/IAP identifying technological advances. Of the 9 advances identified, 7 were also known and listed as advances in the 1998 NE NPR-A EIS.26 The one advance that was not expressly discussed in the 1998 NE NPR-A EIS/IAP, the modification of seismic operation vehicles in order to reduce ground pressure, is a practice that had been used for years before 1998 and is hardly a convincing reason to change the management of the NE NPR-A, much less amend the existing EIS or ROD. It has no bearing on opening the area around Teshekpuk Lake to leasing or year-round surface occupancy. ***(Comment No.* 197616-027)**

Response To: Comment 197616-027

The BLM is re-evaluating the decisions made in the 1998 ROD as a result of the President's NEPDG recommendation that the President direct the Secretary of Interior to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska" and that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska." The new technology identified during scoping represents new circumstances that must be factored into the analysis when considering making these additional areas available to leasing. This new information does not lead to any particular decision, however, new technology may very well lesson impacts, thereby influencing the final decision.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The only other technological advance listed that was not included in the 1998 NPR-A EIS/IAP is the modular drilling platform that was tested on the North Slope by Anadarko.28 We pointed out in our scoping letter that the Anadarko modular drilling platform was more of a technological failure than a technological advancement.29 The modular drilling platform's failure to live up to its promises should have been mentioned in the Amended Draft EIS or mention of the platform should have been left out altogether. Regardless, the existence of the platform was not factored into the development scenario and so the platform's mere existence, probably in a scrap heap somewhere, basically has no bearing on whether it was appropriate to amend the 1998 NPR-A EIS/IAP. ***(Comment No.* 197616-030)**

Response To: Comment 197616-030

This drilling rig was only referenced as a new technology with some potential. It was not incorporated in any of the environmental impact analyses.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Another advance mentioned in the Amended Draft EIS is the Arctic Millennium Rig, which is modular, lighter, and can be transported over packed snow instead of over ice roads. Amended Draft EIS p. 4-20. We think that this advance in technology may be welcome from an impacts standpoint if in fact it can be so transported without damaging the tundra. But, this only helps "mitigate the constraints" of the ever shortening ice road season. This advance does not mitigate the impacts of exploration or the impacts of development considered in the 1998 NE NPR-A EIS/IAP. By contrast, if this same drill rig or one like it could be used to drill the Alpine Satellites, that could significantly reduce the impacts of the proposed Alpine Satellites which are currently under review because the proposed bridge across the Nigliq Channel would no longer need to accommodate a heavier, less modular, drill rig. We look forward to seeing this advance in technology discussed in the upcoming Alpine Satellites Final EIS. ***(Comment No.* 197616-031)**

Response To: Comment 197616-031

The text in the Final IAP/EIS has been changed to reflect that this technology is only useful for shallow wells. The use of this technology was not incorporated in our impact analysis.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

In our review of the DEIS and related documents, we found no new information relative to the potential impacts of oil and gas development on molting geese and caribou in the TLSA. In 1998, the Service analyzed the potential for conflicts between oil development and waterfowl in the Teshekpuk Lake region (Martin 1998). That analysis, which is still relevant, noted evidence of behavioral and physiological responses by molting brant to aircraft and other sources of disturbance that would likely accompany oil and gas development. Such disturbance could cause increased energy expenditures, decreased foraging time, and depleted lipid and protein reserves, which could increase the duration of the flightless period and susceptibility to predation. Birds could be displaced from optimal to sub-optimal habitats, resulting potentially in over-crowding and ensuing decline in forage availability. Each of these responses, or any combination of them, could result in reduced survival of molting brant. This is likely also true for other molting geese. ***(Comment No. 197619-007)***

Response To: Comment 197619-007

The Final IAP/EIS has been revised in consideration of your comments. Information in Section 4.4.8.2 Oil and Gas Development, Activities, Air Traffic of the EIS was changed to, "This may not be the case for brant, as they apparently do not acclimate well to aircraft traffic (Derksen et al. 1992). Aircraft disturbance to brant may cause behavioral and physiological responses that could increase energy expenditures and reduce foraging time, which could increase the duration of the flightless period and susceptibility to predation. Birds could be displaced from optimal to sub-optimal habitats, causing birds to spend more time foraging to meet nutrient needs."

TOPIC: BASIC ASSUMPTIONS

ISSUE: OIL AND GAS RESERVOIRS

Comment From: Michael Graesser (Comment Letter No. 196946)

I also see no reason at this time that such a critically important biological region should be threatened by unnecessary exploration. The amount of technically recoverable oil in the NPR is estimated by the USGS to be between 6 billion and 13 billion barrels, at 95% and 5% confidence levels respectively. As the actual amount of recoverable oil is usually less than what is technically recoverable, this is not much oil - it is comparable to the estimates for the Arctic Wildlife Refuge. ***(Comment No. 196946-003)***

Response To: Comment 196946-003

The commenter is correct that the current U.S. Geological Survey (USGS) technically recoverable resource estimate (without regard to the economics of finding and production) at a 5 percent probability of occurrence for the entire National Petroleum Reserve-Alaska is 13.2 Bbbl. The Draft IAP/EIS reports 3.6 Bbbl as the mean economically recoverable estimate at $30/bbl for the Northeast Planning Area portion of the National Petroleum Reserve-Alaska. For comparison, the current USGS mean economically recoverable estimate for the ANWR 1002 area is 7.7 Bbbl. The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil

TOPIC: BASIC ASSUMPTIONS

ISSUE: OIL RESOURCES

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

In any event, the possibility that there may be more oil that will not be recovered under the current management of the Northeast NPR-A than under an amended plan it simply not relevant. Congress has directed the BLM to manage the NPR-A under such conditions, restrictions, and prohibitions that are necessary to mitigate adverse impact on surface resources, and to provide maximum protection to the Teshekpuk Lake Special Area.39 These:

protections efforts are not intended as a prohibition of petroleum and related activities. However, a balance must be achieved to provide opportunities for successful oil and gas operations while providing maximum protection for the environment and local residents. ***(Comment No. 197616-040)***

Response To: Comment 197616-040

Section 102 of the Federal Land Policy and Management Act (FLPMA) requires that BLM manage all of its lands from a multiple-use perspective. Oil and gas leasing is a legitimate use of BLM-managed lands and a specific use designated for the National Petroleum Reserve-Alaska since it was established in 1923. As an agency of the federal government, BLM is responsible for implementing the President's National Energy Policy to President's Energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The mandate further states that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska." In accordance with the President's energy policy, BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing. The development and refinement of measures to protect unique cultural, natural, fish and wildlife, and scenic and historical values is an ongoing process that does not end with this NEPA process or with adoption of an Integrated Activity Plan. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted.

TOPIC: BIRDS

Comment From: patriotic US citizen (Comment Letter No. 149424)

LONG-DISTANCE TRAVELERS Other species that come to the Teshekpuk Lake region in large numbers include Steller's EIDER, northern PINTAILS, tundra SWANS and rare yellow-billed LOONS. Some will migrate as far south as the Antarctic. ***(Comment No. 149424-010)***

Response To: Comment 149424-010

I don't believe that the species mentioned migrate to the Antarctic. There is no evidence to suggest that Steller's eiders come to the Teshekpuk Lake area in large numbers.

Comment From: Gwen Heisterkamp (Comment Letter No. 161699)

As a brant educator I have witnessed first hand the majesty of these birds and the incredulity of their journey from the Artic to Baja, Mexico. I fear their fate as their eelgrass habitat disappears along the coast and as their molting and

breeding habitats are destroyed in the Artic. ***(Comment No.* 161699-004)**

Response To: Comment 161699-004

It is true that the area being considered is very important for brant. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: The Wildlife Society (Comment Letter No. 191279)

The Teshekpuk Lake goose molting area, composed of wetlands north and east of Teshekpuk Lake, supports tens of thousands of Pacific brant, greater white-fronted geese, Canada geese, and lesser snow geese during the flightless molt period. The area is nationally and internationally recognized as the most important goose molting area in the circumpolar arctic. ***(Comment No.* 191279-003)**

Response To: Comment 191279-003

It is true that the area being considered is very important for the geese mentioned. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: The Wildlife Society (Comment Letter No. 191279)

The BLM Preferred Alternative (Alternative B) would result in a loss of protection for 35%, 51%, 46%, and 56% of the Pacific brant, greater white-fronted geese, Canada geese and lesser snow geese, respectively, which molt in the Teshekpuk Lake region. Based on the scientific literature, including a review by the National Research Council (2003), this change in land protection status will adversely impact molting geese, particularly brant. ***(Comment No.* 191279-004)**

Response To: Comment 191279-004

See response to comment 191279-003 under Birds

Comment From: The Wildlife Society (Comment Letter No. 191279)

Flightless geese feed along moss/peat shorelines immediately adjacent to open water (Derksen et al. 1982, Weller et al. 1994). These narrow moss flats provide specific plant foods for geese that spend up to 50% of their time in foraging (Derksen et al. 1982). Importantly, the availability of these foraging flats along shorelines of thaw lakes is very limited—only about 2% (about 800 ha) of all habitats classified in the Teshekpuk Lake molting area (over 400,000 ha) consisted of this land cover class (Markon and Derksen 1994). Other features that make the Teshekpuk Lake area significant for molting geese include the limited number of predators (Derksen et al. 1979), absence of anthropogenic disturbances, and large, actively changing basins (Weller and Derksen 1979) where flightless birds seek protection in water or on ice floes (Weller et al. 1994). Clearly, this molting area is unique and of international significance for North American and Russian populations of geese that are important to the nations of the United States, Canada, Mexico, and Russia. The material presented in the IAP/EIS (Affected Environment) is incomplete and should be updated and expanded to include this information.

The IAP/EIS does not accurately portray the potential impacts of the Preferred Alternative (Alternative B) to molting geese in the TLSA. It is well documented that molting geese are sensitive to anthropogenic disturbances (Derksen et al. 1979), especially aircraft overflights (Jensen 1990, Miller et al. 1994) that would be likely if industrialization of the Teshekpuk Lake area were to occur. Running, swimming, and other behavioral responses to disturbance events increase stress to molting geese (Jensen 1990, Taylor 1995). Reductions in feeding time or excessive energy

expenditures may compromise fitness and survival or reproductive success (Taylor 1993). ***(Comment No. 191279-008)***

Response To: Comment 191279-008

It is true that the area being considered is very important for the geese mentioned and that geese and habitat in the TLSA need protection from disturbance. The IAP/EIS has been updated to emphasize the potential for aircraft to disturb molting brant and other geese. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. Under Alternative B no development is permitted in goose feeding areas near lake shorelines in most of the TSLA. In addition, other stipulations are in place to minimize or eliminate increased levels of predation by predators attracted to developed areas. It is also likely that pre-development studies will identify areas that may require special protection or areas important to species of concern such as brant.

Comment From: The Wildlife Society (Comment Letter No. 191279)

Most significantly, the IAP/EIS does not recognize that the boundaries identified for areas open to leasing under the Preferred Alternative (Alternative B) will expose large numbers of molting geese to industrial activity. Based on analysis of a 25-year U.S. Fish and Wildlife Service data set on molting geese and distribution (Mallek 2003), Alternative B would protect an average of only 56% of the brant (range = 41-70%), 49% of greater white-fronted geese (range = 27-74%), 51% of Canada geese (range = 30-67%), and 44% of lesser snow geese (range = 7-97%) when lakes that are intersected by the boundaries of the proposed lease area are grouped with those lakes wholly in the lease area (Martin 2004). Compared to current protection mandated by the 1998 Record of Decision, adoption of Alternative B would result in reductions of 35% (brant), 51% (greater white-fronted geese), 46% (Canada geese), and 56% (lesser snow geese) in the average proportion of molting goose populations protected from impacts of oil and gas development. This is an unacceptable risk given what we know about response of molting geese to human disturbance. ***(Comment No. 191279-010)***

Response To: Comment 191279-010

Protection from disturbance and habitat loss for molting geese is definitely reduced under the current proposed Alternative B compared to the 1998 IAP/EIS. Stipulations and ROPs have been established in and effort to provide protection to molting geese from impacts of oil field development.

Comment From: The Wildlife Society (Comment Letter No. 191279)

At least 17 species of shorebirds breed regularly on the NPR-A (Andres 2004) and this diverse group includes the most abundant and widespread bird species on the Arctic Coastal Plain. Shorebirds are vulnerable to the impacts noted in the IAP/EIS, including: displacement from habitats converted to gravel fill, collisions with structures such as buildings and power lines, and potentially lowered reproductive success due to locally elevated predator populations. Increased predation, if it occurs, has the potential for the most profound effect because the spatial scale of impact would reach far beyond the development footprint. Habitat loss is also of concern, and the IAP/EIS understates the potential effect on shorebirds by presenting it as a mixed blessing for birds ("good" for some species, not for others). Most shorebirds (with the exception of red-necked phalaropes) occur in lower than expected densities adjacent to oil field roads (Troy 1993, 2000), and all shorebird species are displaced from nesting areas adjacent to oil field facilities when those areas remain snow-drifted or are covered with impounded water during the nest initiation period. ***(Comment No. 191279-012)***

Response To: Comment 191279-012

Stipulations and ROPs have been established to minimize or eliminate increases in predators on tundra-nesting birds including shorebirds. See also response to comment 191279-008. The IAP/EIS indicates that tundra covered by gravel is lost as breeding habitat for tundra-nesting birds and that disturbance in areas adjacent to gravel infrastructure may also preclude birds from nesting near infrastructure. The IAP/EIS indicates that although impoundments may reduce nesting habitat for some species, other species, such as some waterfowl and loons, may benefit by the

formation of impoundments.

Comment From: The Wildlife Society (Comment Letter No. 191279)

The IAP/EIS fails to adequately evaluate impacts of oil development on species that are of conservation concern, inhabit rare habitats, or species that are sensitive to disturbance. Of the approximate 17 breeding shorebird species on the NPR-A (Andres 2004), seven are on the U.S. Fish and Wildlife Service's Birds of Conservation Concern (BCC) list, including dunlin, American golden-plover, whimbrel, bar-tailed godwit, ruddy turnstone, buff-breasted sandpiper and stilt sandpiper. These species have been identified based on several factors, including population trends, threats, distribution, abundance, and area importance. The goal of creating the BCC list is to prevent or remove the need for additional Endangered Species Act bird listings by implementing proactive management and conservation actions. The practice of locating oilfield roads and facilities in areas of higher elevation might also adversely affect species that rely on this rare habitat type. Higher elevated dry sites occur in much less frequency than the better protected wetlands that occur commonly throughout much of NE NPR-A. **(Comment No. 191279-014)**

Response To: Comment 191279-014

The potential for loss of upland habitat related to oil development is pointed out in the IAP/EIS.

Comment From: The Wildlife Society (Comment Letter No. 191279)

The IAP/EIS does not consider that populations of common shorebird species that breed on the NPR-A, including dunlin, red phalarope and ruddy turnstone, are declining. Reasons for the declines are unknown and difficult to determine because they may occur at many points throughout the life cycle of the birds. The omission of this information leads to an inaccurate assessment of the possible effects of oil and gas activities to shorebird populations using the NPR-A. **(Comment No. 191279-015)**

Response To: Comment 191279-015

The cumulative impacts section does indicate the potential for birds to be affected by naturally occurring phenomenon or human-caused disturbances or activities not only on their breeding grounds but also along migratory routes or in wintering areas.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-80 thru 2-81: the conclusions regarding effects on birds seem contradictory. The conclusion is reached under Alternative B that overall impacts to birds would be negligible to minor. It is also stated that effects to birds would be highest under Alternative C, yet the conclusion is reached that that alternative would "likely result in negligible population effects." A conclusion of "negligible to minor" effects under Alternative B versus "negligible" effects under Alternative C would imply that B, rather than C, would have a higher level of effects. Further, the discussion under Alternative A acknowledges that if a "spill were to enter a river delta or nearshore marine habitats occupied by substantial numbers of birds, minor to moderate effects would be likely for stable/increasing and declining species populations, respectively." The same should be acknowledged for the other two alternatives. **(Comment No. 196407-079)**

Response To: Comment 196407-079

The text has been revised in Table 2-3, Birds, to better reflect the types and magnitude of impacts that could occur to birds under each alternative.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-81: any conclusion with respect to the potential overall loss of bird habitat on the North Slope in the cumulative effects analysis is essentially meaningless without reference to preferred and critical habitat or some other

area-specific measure of habitat value. The conclusion that less than 1% of North Slope bird habitat would be affected by planning area development is irrelevant. In addition, the decline in populations of some North Slope bird species is not merely "apparent", but has been observed and documented. The section states the obvious in noting that there is "uncertainty regarding the ultimate effect of any spills on bird populations." What can surely and should be said is that if a significant spill were to occur at a time and in a place where a species in decline is concentrated, the population impact could be devastating. ***(Comment No. 196407-080)***

Response To: Comment 196407-080

The text has been revised in Table 2-3 and throughout the Final Amended IAP/EIS to note that although less than 1% of the North Slope bird habitat could be impacted by proposed activities in the Planning Area, the impacts to birds could be much greater if critical habitat, areas with high bird concentrations, or areas with sensitive species were impacted. At the same time, if development occurred in an area that was relatively unimportant to birds, impacts could be minor.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-106, fifth full paragraph: it is unclear how the conclusions in the last sentence were reached. There seems to be an assertion that the potential for impacts to birds due to exploration activities would double for both Alternatives B and C relative to Alternative A. This requires greater explanation and support. ***(Comment No. 196407-097)***

Response To: Comment 196407-097

The potential impacts to birds differ among the alternatives due to differences in the development scenarios.

Comment From: Ducks Unlimited (Comment Letter No. 196943)

The draft EIS must recognize the broad interests of stakeholders from throughout the U.S., arctic and boreal Canada, Russia, Mexico, and First Nations of Canada in the migratory bird resources of this region. For example, a large proportion of black brant that breed on the Yukon-Kuskokwim Delta congregate in the TLSA to molt. Thus, long-term effects on subsistence communities are not limited to the North Slope Borough. ***(Comment No. 196943-013)***

Response To: Comment 196943-013

The BLM recognized the broad interests of stakeholders from other states and countries in Section 1.10, Interrelationships and Coordination with Other Agencies.

Comment From: Pacific Flyway Council (Comment Letter No. 196949)

TLSA is the major molting ground for Midcontinent white-fronted geese that breed on the North Slope. Recent surveys indicate a significant increase in molting by these birds in TLSA-up to 35,000 and averaging over 23,000 for the past five years. ***(Comment No. 196949-006)***

Response To: Comment 196949-006

There is concern about potential impacts of oil development in TLSA to waterfowl species including white-fronted geese. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and nesting waterfowl to the potential impacts of oil development. Some additions were made to the EIS to clarify the importance of the TLSA to molting geese.

Comment From: Pacific Flyway Council (Comment Letter No. 196949)

The draft amended IAP/EIS should specifically recognize the broad interests of stakeholders from other states, Arctic Canada, Russia, and Mexico in the migratory bird resources of the Northeast Planning Area, and assess the potential impacts of leasing and development on those interests. ***(Comment No. 196949-015)***

Response To: Comment 196949-015

The BLM recognized the broad interests of stakeholders from other states and countries in Section 1.10, Interrelationships and Coordination with Other Agencies.

Comment From: John Strasenburgh (Comment Letter No. 196951)

Please, name for me one credible scientific study since 1998 that discounts the vital importance of Teshekpuk Lake Special Area to migratory bird nesting, rearing, molting, pre-migration staging. Or one that discounts the importance of this Special Area to the Teshekpuk caribou. I don't believe you can. ***(Comment No. 196951-007)***

Response To: Comment 196951-007

The Teshekpuk Lake Special Area is a very important area for nesting, brood-rearing, molting, and migrating waterfowl. There is no dispute about this.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

General Concerns: Northeast NPR-A is a very important breeding habitat for many migratory waterbirds, including yellow-billed loons, red-throated loons, spectacled eiders, Steller's eiders, king eiders, long-tailed ducks, and 17 species of shorebirds, including seven that are on the US Fish and Wildlife Service's Birds of Conservation Concern list. Many of these birds, such as yellow-billed loons, are highly sensitive to human disturbance. They also are vulnerable to the effects of predation by the increased numbers of predators that are sometimes associated with Arctic oilfields. ***(Comment No. 197610-068)***

Response To: Comment 197610-068

The importance of the NE-National Petroleum Reserve-Alaska to species of concern such as yellow-billed loon and to threatened species such as spectacled and Steller's eiders is well documented. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of all birds to the potential impacts of oil development. Specific stipulations have been established to reduce the potential of increased levels of predation on tundra nesting birds due to increases in predator populations. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Environmental Coalition (Comment Letter No. 197617)

C. NESTING WATERBIRDS The Northeast Planning Area is the most important breeding habitat for many migratory waterbirds including yellow-billed loons, red-throated loons, spectacled, Steller's, and king eiders, long-tailed ducks, and 17 species of shorebirds, including seven that are on the USF&WS's birds of conservation concern list. Many of these birds, such as yellow-billed loons, are very sensitive to human disturbance. There is a considerable body of scientific literature to show that the Teshekpuk Lake area is unique and irreplaceable habitat for many species of waterbirds. The significance and value of the Teshekpuk Lake area is recognized by the Fish and Wildlife Service, Alaska Department of Fish and Game, Pacific Flyway, California Waterfowl Association, Yukon Delta Native Villages, North Slope Borough, and many regional and national conservation organizations including the National Audubon Society. Many of the same organizations have recommended deferral of this area from leasing or outright permanent protection.

Response To: Comment 197617-094

There is no dispute regarding the importance of the TLSA to birds in general and to the species mentioned. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of tundra-nesting birds and wildlife to the potential impacts of oil development. Specific regulations address measures to mitigate potential increases in predation pressure on tundra nesting bird due to increases in predator populations. Other regulations establish setbacks from molting areas within which facilities may not be constructed. Regulations also address potential disturbance from vehicular and air traffic, pedestrians, noise, and habitat loss. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Direct effects of industrial development on the breeding grounds include disturbance by ground and air traffic, nest failure due to lake drawdown, toxic contamination, and vegetative disturbance on breeding lakes. Secondary effects—because of the availability of garbage— are increased predator populations, including glaucous gulls (Larus hyperboreus) (North and Ryan 1988) and parasitic jaegers (Stercorarius parasiticus) (Barr 1997, Johnson et al. 1996) and red (Vulpes fulva) and Arctic foxes (Alopex lagopus). An additional potential result of development is an increase in nest desertion subsequent to direct human disturbance (Gabrielson and Lincoln 1959, North 1994, Barr 1997, Fair 2002). ***(Comment No.* 197617-101)**

Response To: Comment 197617-101

There is concern regarding the effects of development on yellow-billed loon. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of loons and other wildlife to the potential impacts of oil development. Specific regulations address measures to mitigate potential increases in predation pressure on tundra nesting bird due to increases in predator populations. Other regulations establish setbacks from molting areas within which facilities may not be constructed. Regulations also address potential disturbance from vehicular and air traffic, pedestrians, noise, and habitat loss. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern such as yellow-billed loon.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Given the international importance of this area to molting geese, the current status of the Pacific brant population, the significant segment of the brant population that annually molts in the area north of Teshekpuk Lake, research suggesting that brant do not habituate to such disturbance (Owens 1977, Burger 198 1, Derksen et al. 1992), the apparent lack of suitable alternate molting habitat on the Alaskan Arctic Coastal Plain, uncertainty regarding the implementation and effectiveness of proposed stipulations and ROPs in mitigating disturbance, and the importance of these brant to subsistence hunters in northern, western and southwest Alaska, the Service believes that clearly defined restrictions governing air traffic in the vicinity of the goose molting area that will be consistently implemented and enforced must be developed for the Final EIS and incorporated into the ROD. These comments are also relevant to Sections 4.4.8.2, Pane 4-205, Effects of Disturbances, Oil and Gas Development, Activities, Air Traffic; 4.5.8.2, Page 4-289, Effects of Disturbances, Oil and Gas Development, Air Traffic; and 4.6.9.8, Page 4-382, Birds, Cumulative Analysis, Effects of Disturbance, Aircraft and Vessel Disturbance, Paragraph 3 (below). ***(Comment No.* 197618-034)**

Response To: Comment 197618-034

BLM agrees that clearly defined restrictions governing air traffic in the vicinity of the goose molting area should be a component of the Final Proposed Action – please see ROP F-1 and Stipulations K-4 and K-11.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Table 2-3, Page 2-8 1, Effects on Birds: The DEIS concludes that under the draft Preferred Alternative, "Stipulations and ROPs would minimize effects to birds; overall, Impacts (sic) would be negligible to minor," and that under Alternative C, leasing and development "would likely result in negligible population effects." However, no information is provided to support these statements. Information on and analysis of the amount of land affected by changes in management designations, bird diversity, nest density, and effects of disturbance on bird survival, productivity, and recruitment are needed to support such a statement. Further, under all three alternatives, the DEIS indicates that the birds will simply be "displaced," whereas very little scientific data are available to suggest birds can simply move to a new area, which may already be saturated with breeding birds or which may not provide the suite of resources present in the areas currently used by birds in the planning area that were selected in the absence of disturbance and development. Many species of shorebirds are highly site faithful, and loss or alteration of traditional breeding sites may prevent these birds from breeding successfully. Thus, displaced birds may become part of the nonbreeding portion of the population, resulting in reduced productivity and lower recruitment rates. ***(Comment No.* 197618-041)**

Response To: Comment 197618-041

Table 2-3 provides a summary of the impacts identified and discussed in Chapter 4, Environmental Consequences; information to support statements in this Table are provided in Chapter 4. A discussion of the impacts criteria was added to Section 4.1 of the Final Amended IAP/EIS to help the reader better understand how impacts were assessed and compared. Stipulations and ROPs would help to reduce impacts to birds. Statements on the effects of oil and gas activities to birds in Table 2-3 have been revised to better reflect the types and magnitude of impacts identified in Section 4.3.8, 4.4.8, and 4.5.8 (Birds). These sections have also been modified to better address the concerns of the commenter. The potential for shorebirds and other bird species with high site fidelity to be displaced by oil and gas activities and become part of the nonbreeding portion of the population has also been included in these sections.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

3.4.2, Page 3-69, Subsistence: Oil and gas development in the Northeast Planning Area of the NPR-A could have dramatic effects on bird populations should residents (both native and nonnative) have access to newly built roads for hunting. This is particularly relevant given the recent legalization of an Alaska Subsistence Spring/Summer Migratory Bird Harvest. Across the state, residents are able to legally harvest some 34 waterfowl, 6 waterbirds, 30 seabirds, 1 crane, 2 owls and 18 shorebird species. In the Planning Area, legal spring and summer harvest may occur between 2 April and 6 June, and between 16 July and 3 1 August in 2004 (except for King and Common eiders which have a slightly different season). This new legal harvest may increase the number of non-native hunters that now can legally harvest birds in the spring and summer. Efforts should be made to minimize any use of oil and gas development infrastructure that would promote access to new hunting areas previously difficult to access. More information on this new harvest can be obtained at http://alaska.fws.gov/ambcc/Regulations.htm. ***(Comment No.* 197618-069)**

Response To: Comment 197618-069

We recognize the importance of this issue and believe it is most appropriately dealt with during the authorization/permitting phase (see Section 2.6.2.1); at that time updated specific information concerning proposed access routes, and current harvest limits and other relevant specifics will be available. With this updated information the BLM would consult with industry and other concerned entities to address this issue.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.8, Page 4-202, Birds: Besides birds being simply displaced, the authors should note the possibility that displaced birds may breed less successfully or not at all and ray have higher mortality rates than birds able to return to their original breeding site. This is a distinct possibility because displaced birds may be forced to settle for lesser quality habitat. ***(Comment No.* 197618-076)**

Response To: Comment 197618-076

These issues are addressed in the various sections of the No Action Alternative. How these development effects may differ among alternatives is discussed in each alternative.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.8.2, Page 4-203, Effects of Disturbances, Exploration: The introductory paragraph of this section states that temporary displacement of a small number of birds from preferred sites ray occur. The third paragraph, however, states that permanent displacement from nesting, feeding or brood-rearing habitats may occur. The discrepancy should be reconciled in the introduction, which should summarize the general finding that is supported in subsequent paragraphs. The DEIS also states that conducting surveys after the nesting season would eliminate potential for nest abandonment. This sentence should acknowledge that information on nesting would be sacrificed if it was not collected during the nesting season. ***(Comment No.* 197618-077)**

Response To: Comment 197618-077

I see no contradiction in the statements cited in the first and third paragraphs. The first paragraph indicates that some birds could be temporarily displaced by winter seismic activities. The third paragraph indicates that summer activities near the shoreline of Teshekpuk Lake could cause permanent or temporary displacement. "Conducting surveys" has been changed to "conducting support activities". I hope that this answers your concerns.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.8.4, Page 4-208, Conclusion: It seems unlikely that "once exploration and development/production ceases in an area, bird populations and habitat could recover" unless land area can be restored to its previous state. Restoration is cost prohibitive, and there are assurances that roads and pads ultimately will be removed and habitats restored. These areas would still have habitat loss, and the roads may provide increased and continued long-term access routes in the future for the public to hunt, and thus birds using the surrounding area would continue to be affected by increased access in areas with historically lower levels of access. This comment applies also to 4.5.8.4, Page 4-29 1, Conclusion. ***(Comment No.* 197618-085)**

Response To: Comment 197618-085

The Final IAP/EIS has been revised in consideration of your first comment. Section 4.4.8.4 Conclusion was changed amended to reflect that bird populations could recover from disturbance related activities. The issue of increased access to subsistence hunters is addressed elsewhere in the EIS and is not discussed in Sections 4.6.9.8 Birds and 4.12.3.12 Subsistence

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.6.9.8, Page 4-382, Birds, Cumulative Analysis, Effects of Disturbance, Aircraft and Vessel Disturbance: The last sentence of paragraph 3 states that disturbance from aircraft would affect a small percentage of total bird This statement is speculative, particularly because there are no stipulations that specifically and with certainty direct how air traffic will occur in the goose molting area. Our comments (above) for Section 4.4.8.2, Page 4-205, Effects of Disturbances, Oil and Gas Development, Activities, Air Traffic are incorporated here by reference. ***(Comment No.* 197618-101)**

Response To: Comment 197618-101

As previously stated, BLM agrees that clearly defined restrictions governing air traffic in the vicinity of the goose molting area should be a component of the Final Proposed Action – please see ROP F-1 and Stipulation K-4.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.7.8, Page 4-42 1, Unavoidable Adverse Impacts, Birds and 4.9.8, Page 4-432, Unavoidable Adverse Impacts, Birds: These sections should adequately describe the potential consequences of encroachment into the Goose Molting Area. There is little evidence that displaced birds simply move to adjacent habitat. **(Comment No. 197618-110)**

Response To: Comment 197618-110

Studies conducted by Troy in the Prudhoe Bay oil field and by Johnson in the Alpine area suggest that some nesting birds displaced by oil development may move to adjacent areas. This section states that the most important impacts would occur if development takes place in areas of high bird use such as the Teshekpuk Lake goose molting area.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.9.8, Page 4-432, Irreversible and Irretrievable Commitment of Resources, Birds: This section should adequately describe the potential long-term consequences of encroachment into the Goose Molting Area. **(Comment No. 197618-112)**

Response To: Comment 197618-112

Irretrievable resource loss may likely result from gravel placement. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to protect critical goose molting habitat. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

TOPIC: BIRDS

ISSUE: BRANT

Comment From: Sharon Wyberg (Comment Letter No. 186677)

This leads to our other specific comment, that you cannot ethically ignore your own Interior Department's scientists and data. This data, gathered between 1999 and 2003, unambiguously shows how an average of 47 percent of the brant and 44 percent of the white-fronted geese that now molt on lakes that would be partly or wholly unprotected in your preferred alternative. Those are huge population impacts that are not reasonably brushed aside for political expediency. **(Comment No. 186677-006)**

Response To: Comment 186677-006

See response to comment 191279-003 under Birds

Comment From: John Dingell, Congress of United States (Comment Letter No. 196942)

Recent analysis by the Alaska Science Center suggests that 44 percent of the molting brant in the Teshekpuk Lake area have used lakes over the last five years that would be available (in their entirety or in part) for leasing under the preferred alternative. Since this area provides critical molting habitat for up to 30 percent of the population of Pacific brant, potential impacts to this population during their sensitive molting season could have substantial consequences to the Pacific Flyway population. Furthermore, the Pacific Flyway population is substantially below management objectives. Thus, increased development in this area may place this population at significant risk. In addition to brant, 44 percent of white-fronted geese and 58 percent of Canada geese have also used lakes for molting that would become available for leasing and industrial development under the preferred alternative. **(Comment No. 196942-005)**

Response To: Comment 196942-005

There is concern about potential impacts of oil development in TLSA to brant and other waterfowl species. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and nesting waterfowl to the potential impacts of oil development.

Comment From: Ducks Unlimited (Comment Letter No. 196943)

It is a critical staging and molting habitat for a significant portion of the world's population of Pacific black brant. These birds breed in western Alaska, Canada, and Russia and are protected under international treaties. We remain particularly concerned about declining brant populations, to the point where restrictive hunting thresholds could be reached. Western Arctic brant have a very small population and disturbance or perturbation could put this population at increased risk. ***(Comment No.* 196943-008)**

Response To: Comment 196943-008

There is concern about potential impacts of oil development in TLSA to brant and other waterfowl species. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and nesting waterfowl to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Ducks Unlimited (Comment Letter No. 196943)

Published work has shown that TLSA is unique and no other known area within the Alaskan Coastal Plain could replace this habitat for brant. This past work also shows that helicopter disturbance has a measurable effect on body condition of brant during the molting period with implications for survival. The combination of low-lying topography, forage and isolation from predators and disturbance truly makes this area unique for brant. ***(Comment No.* 196943-012)**

Response To: Comment 196943-012

There is agency concern about potential impacts of oil development in TLSA to brant and other waterfowl species. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and nesting waterfowl to the potential impacts of oil development. Specific regulations to help protect waterfowl from disturbance from aircraft, including helicopters, and from potential increases in predation pressure due to increased predator populations are in place. In addition, it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Pacific Flyway Council (Comment Letter No. 196949)

During summer, TLSA is the largest and most significant molting area for Pacific black brant, supporting up to 30% of the entire population from breeding grounds in Canada, Russia, and mostly (up to 70%) the Yukon-Kuskokwim Delta. In addition, some Western High Arctic brant from Canada now use TLSA during the molt; WHA brant, at less than 10,000 birds, are perhaps the smallest goose population in North America. The Council is particularly concerned about impacts that could accelerate declines in black brant (currently within 4,000 birds of a threshold established to restrict all hunting rangewide) or increase risks to the small population of WHA brant. ***(Comment No.* 196949-005)**

Response To: Comment 196949-005

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and nesting waterfowl to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern such as brant. Additions have been made to the EIS to emphasize the importance of the TLSA to brant and other geese.

Comment From: Ornithologists (Comment Letter No. 197606)

We note that brant in the Pacific Flyway are well below desired population levels and are important to subsistence hunters on the North Slope, Yukon-Kuskokwim Delta, and Bristol Bay, and also to sport hunters on the Alaska Peninsula (e.g., at Izembek Lagoon), from Washington to California, and Mexico. Any significant reductions in numbers of brant could trigger restrictions or closures of both subsistence and sport harvests (Pacific Flyway Council 200213). ***(Comment No.* 197606-006)**

Response To: Comment 197606-006

The National Petroleum Reserve-Alaska is an important area for brant. Not only do brant breed in the area, but even larger numbers come here to molt. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting brant and other geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern such as brant.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Recent analysis by the USGS Alaska Science Center (Flint 2004) finds that over the last five years an average of 47 percent of the molting brant in the TLSPA have used lakes that would be wholly or partly available for leasing under the Preferred Alternative. Since this area provides critical molting habitat for up to 30 percent of the population of Pacific Flyway brant, potential impacts to this population during their sensitive molting season could have substantial consequences. The Pacific Flyway population of brant is substantially below management objectives. In fact, the population is nearing the point where further reductions would trigger new restrictions in subsistence and sport harvests throughout the flyway. Thus, increased development in the Teshekpuk Lake area may place this population at significant risk. ***(Comment No.* 197610-052)**

Response To: Comment 197610-052

The importance of the TLSA as an area of importance for molting geese is well documented. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

On p. 3-41, the DEIS describes brant in the Teshekpuk Lake area, and uses an annual mean of 18,500 molting birds. However, there is high annual variation in numbers of molting brant (and other waterfowl). It is important to acknowledge that as many as 36,817 brant—representing 30 percent of the Pacific Flyway population—use this area in some years. In fact, the importance of this area to brant may be best reflected in the years in which usage is greatest, since these are the years in which breeding conditions are poor elsewhere and it is essential that molting geese have quality habitats in which to molt and restore their body condition for future breeding seasons. ***(Comment No.* 197610-056)**

Response To: Comment 197610-056

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.6.3 Waterfowl, Brant in the EIS, "... although as many as 36,817 brant have been reported (Table 3-7). The Teshekpuk Lake Goose Molting Area may be the single most important area for molting brant and other geese in the Arctic, based on information in Mallek et al. (2003) and Malleck (2004)."

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The area northeast of Teshekpuk Lake is one of the highest density brant nesting areas on Alaska's North Slope (USFWS, aerial breeding pair survey data). Approximately 33 percent of Arctic Coastal Plain brant nests occur in areas already affected by oil development (Johnson et al. 1996, Stickney and Ritchie 1996, Ritchie et al. 2000, Sedinger and Stickney 2000) and display low nesting success rates (BP 2001). ***(Comment No. 197610-079)***

Response To: Comment 197610-079

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of brant and other geese and wildlife to the potential impacts of oil development. Specific regulations address measures to mitigate potential increases in predation pressure on tundra nesting bird due to increases in predator populations. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Brood rearing in the western Arctic occurs primarily on Harrison Bay salt marshes between Kogru River and Fish Creek just east of Teshekpuk Lake (Ritchie et al. 2000). Brant may be vulnerable to displacement from optimal breeding-ground nutrient availability and to increases in predation and industrial disturbance during brood rearing. Brant feed more during nesting and depend more heavily on breeding grounds nutrient availability than other geese (Sedinger and Stickney 2000). ***(Comment No. 197610-082)***

Response To: Comment 197610-082

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting and brood-rearing geese including brant to the potential impacts of oil development. These regulations establish setbacks from goose molting lakes within which facilities may not be constructed and establish measures to reduce or eliminate disturbance. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Pacific Black Brant: The area northeast of Teshekpuk Lake is one of the highest density nesting areas on Alaska's North Slope (USFWS, aerial breeding pair survey data). Approximately 33% of Arctic coastal plain brant nests occur in areas already affected by oil development (Johnson et al. 1996, Stickney and Ritchie 1996, Ritchie et al. 2000, Sedinger and Stickney 2000) and display low nesting success rates (BP 2001). Nesting success may decline because of predation by Arctic foxes (Alopex lagopus), glaucous gulls (Larus hyperboreus), ravens (Corvus corax), and brown bears (Ursus arctos) (Sedinger and Stickney 2000, BP Exploration [Alaska] [BP]) 2001). Greater numbers of predators may occur in industrial areas due to anthropogenic sources of food and shelter provided at developed sites (Eberhardt et al. 1982, Martin 1997, Day 1998). The National Research Council (NRC 2003) also found that disposal of garbage in industrialized areas of the North Slope was inadequate to prevent attracting high densities of potential bird predators. Brood rearing in the western Arctic occurs primarily on Harrison Bay salt marshes between Kogru River and Fish Creek just east of Teshekpuk Lake (Ritchie et al. 2000). Brant may be vulnerable to displacement from optimal breeding-ground nutrient availability and to increases in predation and industrial disturbance during brood rearing. Brant feed more during nesting and depend more heavily on breeding grounds

nutrient availability than other geese (Sedinger and Stickney 2000). ***(Comment No. 197617-102)***

Response To: Comment 197617-102

There is concern about the effects of development on brant. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of brant and other geese and wildlife to the potential impacts of oil development. Specific regulations address measures to mitigate potential increases in predation pressure on tundra nesting bird due to increases in predator populations. Other regulations establish setbacks from molting areas within which facilities may not be constructed. Regulations also address potential disturbance from vehicular and air traffic, pedestrians, noise, and habitat loss. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.2.1.4, Page 2-6, Goose Molting Area: The draft should cite the most current references for the maximum numbers of brant recorded in the Teshekpuk Lake Goose Molting Area; 36,817 were observed in 2001, which represented nearly 30% of the estimated world population of Pacific brant for that year (Mallek 2004). Additionally, 34,929 molting greater white-fronted geese were counted in 2002 and 2,674 snow geese, whose numbers have been increasing in recent years, were counted in 2001. ***(Comment No. 197618-020)***

Response To: Comment 197618-020

The text in Section 2.2.1.4 has been revised to incorporate this waterfowl census information.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

The area appears to be most vital to Pacific black brant; in some years nearly 30 percent of the entire population molts there (Mallek 2004). Research also suggests that molting brant do not habituate daily or seasonally to frequent aircraft overflights (Derksen et al. 1992). The Pacific brant population is well below the Pacific Flyway population objective (Pacific Flyway Council 2002) and has been in slow decline for decades (Conant and King 2003). Recruitment has been poor in recent years (Groves 2004), and the population will probably decline below an established management threshold requiring a major reduction in harvest throughout the range. These birds represent a highly-valued subsistence resource in western and northern Alaska and an important sport harvest species on the west coast of the U.S. and Mexico. Given the current vulnerability of the brant population combined with their apparent inability to habituate to disturbance while molting, leasing and development within the Goose Molting Area would likely be detrimental to the population. ***(Comment No. 197618-032)***

Response To: Comment 197618-032

The proposed action includes several measures to minimize the potential impacts to molting geese specifically see Lease Stipulations F-1 (e), K-4, and K-11.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

3.3.6.3, Page 3-41, Swans and Geese, Brant: This section describes the local breeding brant population. The significance of the TLSA to brant, however, is in regard to the molting population. The draft recognizes molting birds but reports the mean number of birds that use the area. Because the size of the molting population on the ACP is dependent on nesting conditions in Canada, Russia, and the YKD, a far more important statistic to report here is the range of counts. This section should report that as many as 36,8 17 Pacific flyway brant used the TSLA in 2001, representing nearly 30% of the entire population (Mallek 2004). ***(Comment No. 197618-049)***

Response To: Comment 197618-049

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.6.3 Waterfowl, Brant, in the EIS, "Although brant are fairly common breeding birds in the Planning Area, the area is even more important as a molting area for brant and other goose species. The largest known concentration of molting and brood-rearing brant on the ACP occurs in the northern portion of the Teshekpuk Lake area (Map 3-15; Derksen et al. 1982). As many as 30 percent of the Pacific flyway population of brant may be present in the Teshekpuk Lake goose molting area during the molting period."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Further, although Service aerial surveys suggest increasing numbers of Pacific brant on the ACP since 1992 (Lamed et al. 2003), the population as a whole is well below the Pacific Flyway population objective (Pacific Flyway Council 2002) and has been in slow decline for decades (Conant and King 2003). Given recent years of poor recruitment (Groves 2004), this population will probably (in January 2005) pass a management threshold requiring a major reduction in harvest throughout the range. These birds represent a highly-valued subsistence resource in western and northern Alaska and an important sport harvest resource on the west coast of the U.S. and Mexico. The EIS should include a figure showing the goose molting lakes (coded with maximum abundance) with the proposed boundaries of the Preferred Alternative overlaid. ***(Comment No. 197618-050)***

Response To: Comment 197618-050

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.6.3 Waterfowl, Brant of the EIS, "Brant populations have experienced slow downward trends in recent years (USFWS 2003). Brant are valued by subsistence users in northern and western Alaska as well as along the West Coast and in Mexico."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Table 3-8, Pave 3-43: This table is misleading with regard to Pacific brant numbers on the North Slope. First, it reports the number of brant observed in the Planning Area in mid-June as a proportion of the estimated northern ACP population index, however, the Breeding Pair Surveys cited as the source of the data often occur in late June, Second, the cited reports specifically advise against using numbers of some species surveyed, including Pacific brant, to construct population indices. Finally, it confuses the differences between brant that breed in the Planning Area with those that congregate there to molt. The number of brant that breed in the Planning Area is relatively small and does not approach 55% of the northern ACP breeding population. The majority of molting brant, which arrive after the survey, are not represented in the table. The total number of brant that molt in the TLSA far exceeds the entire ACP breeding population in most years. The table should clearly recognize these differences. ***(Comment No. 197618-052)***

Response To: Comment 197618-052

The numbers used in the table came from Fish and Wildlife Service in a response to a request from us for information on the percentage of birds that use the area under consideration. The brant numbers are not meant to represent molting birds. The numbers of molting brant are shown on the previous page and table. The text of the EIS will be revised to more clearly point out the importance of the TLSA as a molting area for brant.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.8.2. Page 4-205, Effects of Disturbances, Oil and Gas Development, Activities, Air Traffic: The draft states, '. . .some birds could acclimate to aircraft activity by either remaining in habitats located near aircraft activities, or by moving to nearby habitats." The existing literature suggests that brant do not easily habituate to aircraft disturbances (Owens 1977, Burger 198 1, Derksen et al. 1992), and there is no evidence that nearby areas provide the suite of resources (adequate forage and security from predators) present in the areas currently used by molting brant in the

TLSA and selected in the absence of disturbance. ***(Comment No.* 197618-081)**

Response To: Comment 197618-081

See response to comment 197619-007 under Basic Assumptions - New Studies, Information, or Technology

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

The final paragraph should state that potential additive effects would likely be greatest for Pacific brant due to their sensitivity to disturbance, the current decreasing population trend, and the concentration of up to 30% of the Pacific flyway population in the TLSA. ***(Comment No.* 197618-086)**

Response To: Comment 197618-086

The Final IAP/EIS has been revised in consideration of your comments. The following was added to Section 4.6.8.4 Conclusion, " Potential impacts may be greater for brant than for other species due to their apparent inability to habituate to some types of disturbance (Derksen et al. 1992), their decreasing population size, and the potential for as much as 30 percent of the Pacific flyway population to use the Teshekpuk Lake molting area. Impacts could be even greater if oil and gas activities occurred in areas with high bird concentrations, with high quality habitat, or used by species of concern."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

After five years of intensive study, Derksen et al (1992) concluded that the Goose Molting Area was unique and ***(Comment No.* 197618-097)**

Response To: Comment 197618-097

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Resource data collected since 1998 indicate the continuing importance of the TLSA to fish and wildlife resources. With particular regard to molting geese and caribou, there is evidence this area may be more important than previously thought. Service aerial surveys recorded 36,817 molting Pacific brant north of Teshekpuk Lake in 2001; this represented nearly 30 percent of the entire population of Pacific brant (Mallek 2004). In addition, the Pacific brant population is now below the Pacific Flyway population objective (Pacific Flyway Council 2002) and has been in slow decline for decades (Conant and King 2003). Recruitment has been poor in recent years (Groves 2004), and the population appears poised to decline below an established management threshold that will require a major reduction in harvest throughout the range, beginning perhaps as soon as 2005. Despite their low numbers, Pacific brant are an important resource for subsistence waterfowl hunters on the North Slope and in northwest, western and southwest Alaska; in surveys conducted from 1992-2000, brant accounted for over 13 percent of the reported subsistence goose harvest in these areas (AK Mig. Bird Co-Mgmt. Council 2004). In addition to being a valued subsistence resource in Alaska, these birds also represent an important sport harvest species on the west coast of the U.S. and Mexico. ***(Comment No.* 197619-005)**

Response To: Comment 197619-005

There is no dispute that the Teshekpuk Lake area is unique and an extremely important area for molting geese including brant, as well as other waterfowl and wildlife. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of brant and other geese

and wildlife to the potential impacts of oil development. Specific regulations address measures to mitigate potential increases in predation pressure on tundra nesting bird due to increases in predator populations. Other regulations establish setbacks from molting areas within which facilities may not be constructed. Regulations also address potential disturbance from vehicular and air traffic, pedestrians, noise, and habitat loss. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Myron Manning (Comment Letter No. 197978)

First, my name is Myron Nanning. I'm the president of the Association of Village Council Presidents, and I'm also chairman of the AVCP Waterfowl Conservation Committee. One of the reasons why we requested that the public hearing be held here in Bethel is because back in 1998 when the original request to put -- when the Environment Impact Statement was put together, we were invited to make our comments and to share our comments regarding the potential impacts of migratory birds that our people rely on for subsistence purposes, especially the black brant. That the majority of them nest here in the YK Delta. And some of the birds that are not able to nest during the summer seasons are the ones that fly up there, and those that are not successful in laying eggs, I believe also are -- go up to the North Slope to the Teshekpuk area to molt and prepare for their migration down south. **(Comment No. 197978-051)**

Response To: Comment 197978-051

It is possible that the most of the Pacific brant population could molt in the Teshekpuk Lake area during some years. Stipulations and Required Operating Procedures have been established to minimize any negative effects of development on brant.

Comment From: Myron Manning (Comment Letter No. 197978)

There's a large number of black brant that nest in the YK Delta. We've seen the numbers decline for sometime back in the early 80's where the -- where our people here in the YK Delta were placed on restrictions under the goose management plan, which was put into effect like under the Hooper Bay Agreement back in 1984. Our people were limited in being able to gather eggs from the birds that were molting, the ones that have laid eggs in the region, and even hunt them while they were in flight because there was a certain decrease in the number of black brant, the population of black brant that nest in our region or even fly through the area. **(Comment No. 197978-052)**

Response To: Comment 197978-052

Management of declining brant populations require efforts to reduce or eliminate the cause of these declines. Efforts are being made in North Slope development projects to reduce the potential for development to negatively affect brant and other bird species.

Comment From: Myron Manning (Comment Letter No. 197978)

Black brant is hunted primarily during the spring time by our people in western Alaska. And potential impacts of any oil and gas exploration on the molting birds, it's going to have a big impact because we've seen it even with the impacts by hunters within our own region when birds are molting, or even flightless. They tend to disappear after a while if there is human presence around. And we are concerned that if there is oil and gas exploration during the time when birds are molting up there, those birds will no longer be going there to molt and prepare for flight, they like to go back to their winter grounds. **(Comment No. 197978-053)**

Response To: Comment 197978-053

Brant still use traditional areas in existing oil fields on the North Slope and it may be that factors outside of the effects of development on the North Slope are responsible for declines in the brant population. For example, it has been shown that lead poisoning from spent lead shot has probably been at least partly responsible for declining eider populations.

Comment From: Myron Manning (Comment Letter No. 197978)

So, we are concerned about those, and also we don't want to go back to the days where we will be restricted on our ability to harvest black brant. And this has done -- this plan of -- this plan of goose management plan, which black brant is part of, is considered every two years, so we are keeping a close watch on the populations, the numbers of the birds, and we put a plan together that will impact our people and their use for black brant for subsistence purposes. So, I would highly recommend that BLM take precautionary steps that will not drastically or negatively affect the migratory birds that molt up there. And it may not necessarily be the black brant, but there are other large number of birds that nest within the region, and some of them do go up there to molt. So, we would request strongly, maybe demand that certain precautions are taken to protect the migratory birds that our people rely on for subsistence purposes. With that, I thank you for the opportunity. ***(Comment No.* 197978-054)**

Response To: Comment 197978-054

We agree that it is necessary to take precautions prior to and during development on the North Slope. That is why stipulations and Required Operation Procedures have been established to protect brant and other birds from habitat loss and alteration, and the effects of disturbance.

Comment From: Stan Senner (Comment Letter No. 197978)

The link to the YK Delta is a strong one and of the banded brant recovered at Teshekpuk Lake, 70 percent of them originated in the YK Delta. And so that link is a very very strong one. ***(Comment No.* 197978-089)**

Response To: Comment 197978-089

Yes brant move to the Teshekpuk Lake goose molting area from the Y-K delta and other areas during the molting period.

Comment From: Stan Senner (Comment Letter No. 197978)

As several people have mentioned, most of those brant nesting -- or molting at Teshekpuk Lake are failed breeders or non-breeders. Some may think that means they are unimportant, and that certainly is not the case because one year's failed breeders may be next year's breeders. And having that time on the North Slope where they can molt and build energy supplies may very well determine nesting success in a subsequent season. ***(Comment No.* 197978-090)**

Response To: Comment 197978-090

We have tried to emphasize the importance of the Goose Molting Area for brant.

Comment From: Stan Senner (Comment Letter No. 197978)

Myron Nanning mentioned the restrictions on brant harvests in the YK Delta back in the 80's and the hardship that that caused on residents here, and I don't presume to speak for any of those subsistence users, and that's not my role, but what I can report is that the population of brant in the Pacific fly way right now is within 4,000 birds of triggering once again, a round of harvest restrictions which will affect subsistence harvest, harvesters as well as sport hunters all the way from the YK Delta to Baja Mexico. So, we're within 4,000 birds of a trigger point and any loss of habitat or disturbance at a place like Teshekpuk Lake could well be translated into the loss of some birds in future populations. ***(Comment No.* 197978-092)**

Response To: Comment 197978-092

We recognize the importance of the Teshekpuk Lake area in the life cycle of brant. Should development occur in the area stipulations and required operating procedures would minimize the potential negative impacts to brant to occur.

In addition, pre-development surveys by agencies would likely identify areas of particular concern to brant and other tundra-nesting birds.

TOPIC: BIRDS

ISSUE: LOONS

Comment From: Elizabeth McCloskey (Comment Letter No. 196086)

"Out of proportion" is a excellent description of your entire proposed Alternative B. Protecting a mere 213,000 acres northeast of Teshekpuk Lake is entirely inadequate. For example, it ignores impacts to the yellow-billed loon, which is so wary and secretive that it is known to disappear at the approach of a single human, to say nothing about drilling pads and pipelines! ***(Comment No.* 196086-004)**

Response To: Comment 196086-004

It is true that the area being considered is very important for wildlife and sensitive species such as yellow-billed loon. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern such as yellow-billed loon.

Comment From: Michael R. North (Comment Letter No. 196264)

Page 2-22. Special Conditions in Yellow-billed Loon Habitats. On the surface, these conditions appear to be good measures for protecting yellow-billed loons. I am concerned however, that there are hidden provisions elsewhere that may render these moot. ***(Comment No.* 196264-009)**

Response To: Comment 196264-009

I know of no hidden provisions that will render the special conditions protecting yellow-billed loon habitat moot.

Comment From: Michael Graesser (Comment Letter No. 196946)

As an example, one primary concern is for the birds that nest there. For the yellow-billed loon, it is known that increased egg predation by scavengers, loss of fish for diet, exposure to petroleum products caused by spills, and changes in water levels in nesting lakes, are all associated with oil development. ***(Comment No.* 196946-007)**

Response To: Comment 196946-007

There is agency concern about potential impacts of oil development in TLSA to tundra-nesting birds including yellow-billed loon. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of tundra-nesting birds to the potential impacts of oil development. Specific regulations to maintain lake water levels, eliminate potential increased predation levels, and reduce the effects of an oil spill are in place. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern such as yellow-billed loon.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The Arctic breeding population of yellow-billed loons is distributed unevenly in NPR-A (North and Ryan 1986, North 1993) with localized pockets of relatively higher concentrations of pairs (North 1994, King and Brackney 1997). An estimated 3,100 individuals breed on the Arctic coastal plain, predominantly east and west of the Teshekpuk Lake

area (Larned unpublished data 1993-1999; North 1994; King and Brackney 1997; E. Mallek, US Fish and Wildlife Service (USFWS), Migratory Bird Management, Fairbanks, AK, pers. communication 2002). **(Comment No. 197610-075)**

Response To: Comment 197610-075

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.6.2 Loons, Yellow-billed loon in the EIS, "Breeding yellow-billed loons are distributed unevenly on the ACP and breeding habitat may be more restrictive than for other loon species. Yellow-billed loon is a species of BLM concern due to its low population level, limited breeding habitat, and low productivity. Mallek et al. (2004) reported a population index of approximately 3,000 yellow-billed loons for the ACP."

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The breeding habitat of the yellow-billed loon is the most restricted of any loon species (Barr 1997), and specific lake selection and locales of breeding concentrations remain unpredictable (Earnst 2000). Habitat availability is considered a limiting factor of yellow-billed loon populations, given the apparent nonbreeding individuals observed in summertime marine waters adjacent to the breeding range (North 1994, Barr 1997). **(Comment No. 197610-076)**

Response To: Comment 197610-076

See response to comment 197610-075 under Birds - Loons

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The yellow-billed loon is considered a vulnerable species on the breeding grounds because of low population densities, limited breeding habitat, low productivity levels, and extreme susceptibility to human disturbance (North 1994, Barr 1997). This species is sensitive to habitat change, appears to be intolerant of intense human activity, and is most susceptible to disturbance during nesting and chick rearing (North 1994, Barr 1997). **(Comment No. 197610-077)**

Response To: Comment 197610-077

See response to comment 197610-075 under Birds - Loons

Comment From: Environmental Coalition (Comment Letter No. 197617)

Yellow Billed Loon: The Arctic breeding population of yellow-billed loons is distributed unevenly in NPR-A (North and Ryan 1986, North 1993) with localized pockets of relatively higher concentrations of pairs (North 1994, King and Brackney 1997). An estimated 3,100 individuals breed on the Arctic coastal plain, predominantly east and west of the Teshekpuk Lake area (Larned unpublished data 1993-1999; North 1994; King and Brackney 1997; E. Mallek, U.S. Fish and Wildlife Service [USFWS], Migratory Bird Management, Fairbanks, AK, personal communication 2002). The breeding habitat of the yellow-billed loon is the most restricted of any loon species (Barr 1997), and specific lake selection and locales of breeding concentrations remain unpredictable (Earnst 2000). Habitat availability is considered a limiting factor of yellow-billed loon populations, given the apparent nonbreeding individuals observed in summertime marine waters adjacent to the breeding range (North 1994, Barr 1997). The yellow-billed loon is considered a vulnerable species on the breeding grounds because of low population densities, limited breeding habitat, low productivity levels, and extreme susceptibility to human disturbance (North 1994, Barr 1997). This species is sensitive to habitat change, appears to be intolerant of intense human activity, and is most susceptible to disturbance during nesting and chick rearing (North 1994, Barr 1997). **(Comment No. 197617-100)**

Response To: Comment 197617-100

There is no dispute that yellow-billed loon is a species of special interest and concern. The uneven distribution of yellow-billed loon is displayed on Map 3-11.

The following information was added to Section 3.3.6.2 Loons, Yellow-billed loon, "Breeding yellow-billed loons are distributed unevenly on the ACP and breeding habitat may be more restrictive than for other loon species. Yellow-billed loon is a species of BLM concern due to its low population level, limited breeding habitat, and low productivity. Mallek et al. (2004) reported a population index of approximately 3,000 yellow-billed loons for the ACP.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

3.3.6.2,. Page 3-39, Loons: It should be noted that most Alaska-breeding yellow-billed loons nest in the NPR-A. In a recent telemetry study of these loons, all monitored birds wintered off the coast of Southeast Asia (J. Schrnutz, USGS-BRD, pers. comm.). It should also be noted that Alaska-breeding red-throated loons have declined significantly since the late 1970s (Groves, et al. 1996). ***(Comment No.* 197618-047)**

Response To: Comment 197618-047

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.6.2 Loons, Yellow-billed loon of the EIS, "Recent studies suggest that yellow-billed loons that breed on the North Slope may winter off the coast of Asia." Additionally, the following information was added to Section 3.3.6.2 Loons, Red-throated loons, "..and Groves et al. (1996) reported declines in the Alaska red-throated loon population since the 1970s."

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

The large central portion of the Planning Area (south of Teshekpuk Lake and between the Ikpikpuk and Colville River ***(Comment No.* 197619CM-008)**

Response To: Comment 197619CM-008

Comment noted and taken into consideration when developing the Final Preferred Alternative.

Comment From: State of Alaska (Comment Letter No. 197620)

Map 3-10, Onshore Density of Pacific Loons. The density of Pacific loons is categorized with non-specific high, medium high, medium, and low categories. There is no definition in quantitative terms as to what density each of these categories represent. The 1998 NE NPR-A document maps presented similar information with quantitative densities (birds/square kilometer). The density information should be presented in quantitative terms to match that presented in the 1998 document. In addition, the density information is presented only for the years 1998 to 2001. Consideration should be given to including the data presented in the 1998 document with that included in the current document. The density map also presents information for the entire NPR-A, not just the NE portion. While this provides the reader with an overview of the distribution and density of the birds throughout the NPR-A, a map of similar size showing distribution and density within just the NE NPR-A boundaries would be useful. The use of light blue as the color for low density is a similar shade of blue used for water, thereby making it difficult to delineate water from low densities of birds. ***(Comment No.* 197620-058)**

Response To: Comment 197620-058

Actual numerical densities were not provided by our cited source.

Comment From: State of Alaska (Comment Letter No. 197620)

Map 3-1 1, Onshore Density of Yellow-billed Loons. Same comments as Map 3-10. ***(Comment No.* 197620-059)**

Response To: Comment 197620-059

Actual numerical densities were not provided by our cited source.

Comment From: State of Alaska (Comment Letter No. 197620)

Map 3-12, Onshore Density of Red-throated Loons. The density information is presented only for the years 1998 to 2002. Consideration should be given to including the data presented in the 1998 document with that included in the current document. The density map also presents information for the entire NPR-A, not just the NE portion. While this provides the reader with an overview of the distribution and density of the birds throughout the NPR-A, a map of similar size showing distribution and density within just the NE NPR-A boundaries would be useful. ***(Comment No. 197620-060)***

Response To: Comment 197620-060

Actual numerical densities were not provided by our cited source.

TOPIC: BIRDS

ISSUE: MOLTING GEESE

Comment From: Sean O'Connor (Comment Letter No. 144940)

The Interior Department's own data speak to the importance of protecting the wetlands at issue. Between 1999 and 2003, 47 percent of brant and 44 percent of white-fronted geese on average molted on lakes that would be exposed to drilling by the preferred alternative. The extant literature shows that geese are highly sensitive to disturbance during molt. The preferred alternative presents an unacceptable risk. ***(Comment No. 144940-002)***

Response To: Comment 144940-002

It is true that the Planning Area is important for a wide variety of wildlife. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of

Comment From: Wallace Elton (Comment Letter No. 182141)

As you should know, the lakes and wetlands within the current protection area form one of the most significant areas of wildlife habitat in the entire Arctic region of the globe and are widely recognized as such by scientists. Tens of thousands of geese, which travel there from at least three countries, gather in this area each year to molt. Data readily available to you indicate that as much as half the Brant (an Audubon Watch List species) and more than 40% of the White-fronted Geese utilize lakes that would have no or reduced protection under the preferred alternative during molt. Thousands of Canada and Snow Geese also gather there. Geese are highly sensitive to disturbance during molting. In fact, it is no accident that this remote area is used so heavily (and in some cases in increasing numbers) by geese for molting. ***(Comment No. 182141-003)***

Response To: Comment 182141-003

See response to comment 191279-003 under Birds

Comment From: Stephanie Danielson (Comment Letter No. 184901)

The Reserve is the largest expanse of federally protected public lands left in the United States. I am very concerned about the preferred plan's emphasis on further development and the affect that this plan will have, not only on the abundant wildlife that lives year-round in the Reserve, but also on the migratory wildlife from my region and around the world that rely on the Reserve as its critical molting, staging, and breeding area. The larger ramifications of disturbing this critical habit area need to seriously be considered and defended. ***(Comment No. 184901-002)***

Response To: Comment 184901-002

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Sarah McGiffert (Comment Letter No. 187460)

Teshekpuk Lake and its surrounding wetlands is a vital tundra-wetland complex in the circumpolar Arctic that is home to thousands of waterfowl and caribou. Tens of thousands of birds, including brant, greater white-fronted geese, Canada and Snow geese gather in the Teshekpuk wetland system to molt their flight feathers and are thus vulnerable to human disturbances. ***(Comment No. 187460-004)***

Response To: Comment 187460-004

See response to comment 191279-003 under Birds

Comment From: The Wildlife Society (Comment Letter No. 191279)

The IAP/EIS is inadequate because it grossly underestimates the potential impacts of the petroleum exploration and development to molting geese and the Teshekpuk Lake Caribou Herd. ***(Comment No. 191279-002)***

Response To: Comment 191279-002

We disagree and feel that the IAP/EIS adequately describes the potential impacts and their potential effects to molting geese and the Teshekpuk Lake caribou herd. It is true that the area being considered is very important for the geese mentioned. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and caribou to the potential impacts of oil

Comment From: Robert Davison (Comment Letter No. 194259)

The Teshekpuk Lake area is used as a traditional molting site for 50,000 to 90,000 geese, including as much as 30 percent of the entire Pacific population of brant and up to 35,000 of the Mid-continent white-fronted geese that breed on the North Slope. Geese, pintails, and tundra swans using this area move through the Central and Mississippi Flyways during the fall and provide highly valued opportunities for recreational hunting and wildlife viewing. The level at which these opportunities are able to continue in the future depends in part on the level of disturbance associated with oil and gas development in geese molting areas of the Northeast NPR-A because geese are vulnerable to disturbance by people and aircraft during their flightless, energy-demanding molt. ***(Comment No. 194259-005)***

Response To: Comment 194259-005

See response to comment 191279-003 under Birds

Comment From: Robert Davison (Comment Letter No. 194259)

The effect of the change to the 1998 decision proposed by Alternative B would be to expose large proportions of molting brant, white-fronted geese and Canada geese to the effects of oil and gas leasing, exploration and development. The National Research Council, for example, found in its 2003 report on the cumulative effects of oil and gas activities on Alaska's North Slope, "If development moves into the Teshekpuk Lake area of the National Petroleum Reserve-Alaska, molting waterfowl could be adversely affected, especially brant." A July 2004 analysis by the U.S. Geological Survey (USGS) Alaska Science Center of the effects of the preferred alternative estimates that over

the last 5 years the percentage of molting brant, white-fronted geese, and Canada geese that would be in leased and borderline areas has averaged 44.7, 37.5, and 50.2 percent, respectively. The effects on molting brant are of even greater concern because the USGS analysis found that "numerically a large number of molting brant are found outside the no-lease area in years of poor productivity on breeding areas." Consequently, the greater magnitude of disturbance that would accompany this expanded oil and gas development is likely to result in reduced populations of brant and white-fronted geese and reduced recreational opportunities. ***(Comment No.* 194259-007)**

Response To: Comment 194259-007

See response to comment 191279-003 under Birds

Comment From: Robert Davison (Comment Letter No. 194259)

WMI shares the concern of the Pacific Flyway Council that expanded oil and gas impacts could accelerate the decline of the Western High Arctic population of brant, which uses the Teshekpuk Lake area during molt. One of the smallest goose populations in North America, these brant currently are within 4,000 birds of a threshold established to restrict all hunting rangewide. These potential impacts and others of the expanded oil and gas leasing proposal have led the Council to recommend that "the sensitive goose molting area should not be offered for leasing," and that the Teshekpuk Lake area "be given permanent protection from future development by Secretarial designation." WMI concurs. ***(Comment No.* 194259-008)**

Response To: Comment 194259-008

See response to comment 191279-003 under Birds

Comment From: Mary Hogan (Comment Letter No. 194604)

The area northeast of Teshekpuk Lake has long been recognized for its importance to molting geese. The area attracts up to 37,000 brant, 35,000 greater white-fronted geese, and thousands of Canada and snow geese in July and August for their annual molt. Molting brant make up to 30 percent of the entire Pacific population. For the importance of this habitat to molting geese, I urge you to continue leasing closures in this area. Loss of habitat at this critical point in the life cycle of geese could have far reaching effects on populations from many parts of the world. ***(Comment No.* 194604-004)**

Response To: Comment 194604-004

See response to comment 191279-003 under Birds

Comment From: Brenda Wright (Comment Letter No. 195732)

Studies have documented a higher sensitivity to disturbance for brant during molt, and for caribou during the calving season. Due to this sensitivity, allowing any activity in the north and east portions of the Teshekpuk Lake Surface Protection Area could result in impacts altering the present use of the area by waterfowl and other wildlife species. Sensitive goose molting area should not be offered for lease; it should not be open to construction of roads, pipelines, or other intrusive facilities; and seasonal human activity should be restricted. ***(Comment No.* 195732-004)**

Response To: Comment 195732-004

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. These regulations limit areas where roads, pipelines, and facilities may be constructed.

Comment From: Michael R. North (Comment Letter No. 196264)

I am particularly concerned that the 213,000 acre proposed goose molting exclusion area is insufficient. Specifically, leasing is proposed in the township that contains the southern half of East Long Lake and the eastern portions of West Long Lake and Goose Lake. These are significant goose molting lakes. I am further concerned that this EIS is a classic piece of obfuscation. For example, on page 4-204, the second full paragraph states that the proposed alternative would be "providing setbacks from goose molting lakes within which permanent oil and gas facilities would be prohibited" "protect the goose molting lakes from oil and gas-related disturbance by requiring features that would screen or shield human activity from the view of any goose molting lake". The paragraph goes on to reference Lease Stipulation K-4. On page 2-30, Lease Stipulation K-4 allows for oil facilities to be constructed IN THE LAKE provided the facility is more than 3/4ths mile from shore! This paragraph and this lease stipulation are in disagreement with one another. Furthermore, it will be impossible to screen any facility located in the middle of a goose molting lake from the molting geese, especially since their response to disturbances (natural or human) often results in their movement into the lake for protection. **(Comment No. 196264-003)**

Response To: Comment 196264-003

The intent of the statement on page 4-204 was that the stipulation would protect the shoreline areas of goose molting lakes, which are the areas of greatest concern and goose activity. The text in Section 4.4.8.2 of the final IAP/EIS has been altered to reflect this. The BLM maintains that the screening of a facility in the interior of a lake is not impossible, as only the screening of human activity on the facility is required.

Comment From: Jim DiPeso (Comment Letter No. 196404)

Teshekpuk Lake is a tundra wetland ecosystem with global significance, serving as essential habitat for brant, snow geese, white-fronted geese, tundra swan, Steller's eiders and many other waterfowl. We are disturbed to hear that BLM's preferred alternative would open waters that nearly half the brant and white-fronted geese now use for molting. ***(Comment No. 196404-002)***

Response To: Comment 196404-002

It is true that the area being considered is very important for the geese mentioned. Steller's eiders may also occur in this area in small numbers as well as large numbers of other waterfowl. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese

Comment From: California Waterfowl Association (Comment Letter No. 196939)

We recognize the efforts of the oil and gas companies in reducing their disturbance during the breeding and molting periods, but feel that increased development in the area will increase the disturbance in the area as well. Geese are vulnerable to disturbance by people and aircraft during their flightless, energy-demanding molt. Conservationists and scientists are concerned that greater oil and gas development in the Teshekpuk Lake area may result in reduced populations of brant, northern pintail and white-fronted geese. **(Comment No. 196939-004)**

Response To: Comment 196939-004

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: John Dingell, Congress of United States (Comment Letter No. 196942)

"The sensitivity of geese during their flightless, energy-demanding molt is well established. Molting geese will run at the sight of a distant person, and disturbance by aircraft overhead - to which brant apparently do not habituate - is a major problem. Behavioral responses to disturbance add stress to the already-taxing requirements of molting geese.

Reductions in feeding time or excessive energy expenditures ultimately many compromise fitness and, hence, survival or reproductive success. The combined effects of industrial oil development in the Teshekpuk Lake area...may shrink habitat available to molting geese and displace them to less optimal habitats. This likely result would be reduced populations of brant and possibly other species, such as greater white-fronted goose." **(Comment No. 196942-004)**

Response To: Comment 196942-004

See response to comment 196942-005 under Birds - Brant

Comment From: John Dingell, Congress of United States (Comment Letter No. 196942)

The proposed 213,000-acre no-lease zone is too small to encompass the entire essential habitat used by molting geese. The National Research Council (2003) explained that the environmental effects of oil development extend well beyond the immediate "footprint" of an oilfield, so the functionally protected area will be even smaller. This small area also does not provide adequate protection for the many nesting birds, including yellow-billed loons, buff breasted sandpiper, and the threatened spectacled eiders, which are vulnerable to increased numbers of predators (e.g., gulls, ravens and foxes) that are attracted to Arctic oilfields. **(Comment No. 196942-006)**

Response To: Comment 196942-006

You are correct in that many waterfowl species nest in this area. The area is likely even more important for molting waterfowl and other wildlife including the threatened and sensitive species mentioned. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife including threatened eiders to the potential impacts of oil development. Specific regulations require measures to minimize or eliminate the potential for increased predation on tundra nesting birds. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Ducks Unlimited (Comment Letter No. 196943)

Ducks Unlimited strongly urges your agency to examine and consider recent analyses of U.S. Fish and Wildlife Service waterfowl survey data completed by the U.S. Geological Survey. Their analyses indicate that the "core" area for molting geese may be shifting. Their data shows that since 1999, an average of 45% of molting brant in the TLSA use lake that would be partially or wholly available for leasing under the "preferred alternative". Given that up to 30% of the Pacific Flyway brant population uses the TLSA, additional leasing could have significant effects on a species whose populations are well below management objectives. And, on average, 38% of molting greater white-fronted geese and 50% of Canada geese use lakes that would be open to leasing. **(Comment No. 196943-011)**

Response To: Comment 196943-011

There is concern about potential impacts of oil development in TLSA to brant and other waterfowl species. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and nesting waterfowl to the potential impacts of oil development. It is true that the area being considered is very important for the geese mentioned. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Pacific Flyway Council (Comment Letter No. 196949)

Throughout most of the planning processes over 20 years, analyses of potential impacts of oil and gas activity on molting geese have not been rigorous and have not recognized the results of a substantial body of relevant research on disturbance and energetic. We recommend a more thorough and objective analysis of this critical subject. **(Comment No. 196949-013)**

Response To: Comment 196949-013

Numerous studies have been conducted on impacts of wildlife including waterfowl that may result from oil development activities. The analysis of potential impacts for the various alternatives was based on the results of these studies. Some additions were made to the EIS to emphasize the importance of the TLSA to molting geese.

Comment From: Sharon and Ken Wyberg (Comment Letter No. 196953)

This leads to our other specific comment, that you cannot ethically ignore your own Interior Department's scientists and data. This data, gathered between 1999 and 2003, unambiguously shows how an average of 47 percent of the brant and 44 percent of the white-fronted geese that now molt on lakes that would be partly or wholly unprotected in your preferred alternative. Those are huge population impacts that are not reasonably brushed aside for political expediency. Further, the preferred alternative would diminish protection for the caribou by fully 75 percent. **(Comment No. 196953-005)**

Response To: Comment 196953-005

There is agency concern about potential impacts of oil development in TLSA to brant and other waterfowl species and to the caribou herd. Since a portion of the TLSA that is closed under the no action alternative would be open to leasing under the preferred alternative, the preferred alternative may present a greater risk for impacts related to disturbance and habitat loss than the no action alternative. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and nesting waterfowl as well as caribou to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Ornithologists (Comment Letter No. 197606)

The sensitivity of geese during their flightless, energy-demanding molt is well established (Derksen et al. 19797). Molting geese will run at the sight of a distant person, and disturbance by aircraft overhead—to which brant apparently do not habituate— is a major problem (Jensen 19908, Miller et al. 19949). Behavioral responses to disturbance add stress to the already-taxing requirements of molting geese (Jensen 1990, Taylor 199510). **(Comment No. 197606-004)**

Response To: Comment 197606-004

The Final IAP/EIS was modified to note this concern. This issue was also considered when developing the Final Preferred Alternative.

Comment From: Ornithologists (Comment Letter No. 197606)

Reductions in feeding time or excessive energy expenditures ultimately may compromise fitness and, hence, survival or reproductive success (Taylor 199311). The combined effects of industrial oil development in the Teshekpuk Lake area and the northward advance of woody vegetation due to climate warming in the Arctic (Sturm et al. 200112) may shrink habitat available to molting geese and displace them to less optimal habitats. The likely result would be reduced populations of brant and possibly other species, such as greater white-fronted goose. **(Comment No. 197606-005)**

Response To: Comment 197606-005

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Ornithologists (Comment Letter No. 197606)

In January 1998, the Pacific Flyway Council (Greer 199814), consisting of waterfowl biologists and wildlife managers from state and provincial wildlife agencies, reached the following conclusions: Eventual development of oil and gas fields associated with structures and disturbance in or near this area [Teshekpuk Lake] could have

significant, long-term impacts on unique habitats used by geese, and the condition and survival of molt-stressed brant. The sensitive goose molting area should not be offered for leasing; it should not be open to construction of roads, pipelines, or other facilities; and seasonal human activity should be restricted, as necessary, to preserve the security of molting geese from disturbance and stress. ***(Comment No. 197606-007)***

Response To: Comment 197606-007

It is true that the area being considered is very important for the geese mentioned. If the area does become available for leasing, Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

General Concerns: The Teshekpuk Lake area is the single most significant waterfowl molting habitat on the Arctic coast of Siberia and North America (King and Hodges 1979, Silva 1985) with tens of thousands of geese gathering to molt in wetland habitats around the Teshekpuk Lake each year. Derksen et al (1992) described this area as: "...unique, and no other known area could replace this habitat for brant anywhere within the Alaskan Coastal Plain." Teshekpuk Lake is exactly the kind of area which should be recognized and given special protection under the habitat-protection provisions of US-Russian migratory bird treaty, especially given that some of the brant using the area originate in Russia (see below). ***(Comment No. 197610-049)***

Response To: Comment 197610-049

The importance of the TLSA as an area of international importance for molting geese is well documented. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

As many as 36,817 brant—up to 30 percent of all Pacific Flyway brant—gather each summer to molt north and east of Teshekpuk Lake (Derksen et al. 1979, 1981, 1982; Taylor 1995; Bollinger and Derksen 1996; Mallek 2004). These brant come from elsewhere on the North Slope, Yukon-Kuskokwim Delta , western Canadian Arctic, and Siberia (Bollinger and Derksen 1996). Numbers of greater white-fronted geese molting at Teshekpuk Lake are increasing and range as high as 35,000. These geese are part of the mid-continental population, wintering in gulf coastal states and Mexico. Thousands of Canada and snow geese also gather to molt in the safety of this unique Arctic wetland complex. ***(Comment No. 197610-050)***

Response To: Comment 197610-050

See response to comment 197610-049 under Birds - Molting Geese

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The TLSPA was established in Northeast NPR-A, in large part, to protect this unique goose molting area. The 1998 plan restricted development in this area following lengthy and detailed consultations with local residents and waterfowl biologists to protect the Arctic molting geese. The Preferred Alternative reduces the TLSPA by 75 percent, and only 213,000 acres north and northeast of Teshekpuk Lake would be restricted from leasing (Fig. 5 and 6). This huge reduction in habitat protection will increase risks to the internationally-significant populations of molting geese using this area. ***(Comment No. 197610-051)***

Response To: Comment 197610-051

See response to comment 197610-049 under Birds - Molting Geese

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

In addition to brant, an average of 44 percent of greater white-fronted geese and 58 percent of Canada geese also have used lakes for molting that would become available for oil development under the Preferred Alternative. ***(Comment No. 197610-053)***

Response To: Comment 197610-053

See response to comment 197610-052 under Birds - Brant

Comment From: Environmental Coalition (Comment Letter No. 197617)

B MOLTING GEESE Teshekpuk Lake area is the most significant waterfowl molting habitat on the Arctic coast of Siberia and North America (King and Hodges 1979, Silva 1985) with tens of thousands of geese gathering to molt around the Teshekpuk Lake wetlands each year. As many as 36,817 brant—up to 30 percent of all Pacific brant—gather each summer to molt north and east of Teshekpuk Lake (Derksen et al. 1979, 1981, 1982; Taylor 1995; Bollinger and Derksen 1996; Mallek 2004). These brant come from elsewhere on the North Slope, the Yukon-Kuskokwim Delta , the western Canadian Arctic, and Siberia (Bollinger and Derksen 1996). Numbers of greater white-fronted geese molting at Teshekpuk Lake are increasing and range as high as 35,000. These geese are part of the mid-continental population, wintering in gulf coastal states and Mexico. Thousands of Canada and snow geese also gather to mole in the safety of this unique Arctic wetland Complex. ***(Comment No. 197617-083)***

Response To: Comment 197617-083

There is no dispute regarding the importance of the TLSA to molting geese.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The Teshekpuk Lake Surface Protection Area was established in the Northeast NPRA, in large part, to protect this unique goose molting area. The 1998 Northeast Planning Area ROD restricted development in this area following lengthy and detailed consultation with local residents and waterfowl biologists, to protect the Arctic molting geese. The Preferred Alternative of the draft Amended IAP/EIS reduces the TLSPA by 75 percent. Only 213,000 acres north and northeast of Teshekpuk Lake would be restricted from leasing. This substantial reduction in habitat protection will increase risks to these significant populations of molting geese. ***(Comment No. 197617-084)***

Response To: Comment 197617-084

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of brant and other geese and wildlife to the potential impacts of oil development. Specific regulations address measures to mitigate potential increases in predation pressure on tundra nesting bird due to increases in predator populations. Other regulations establish setbacks from molting areas within which facilities may not be constructed. Regulations also address potential disturbance from vehicular and air traffic, pedestrians, noise, and habitat loss. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Recent Analysis by the Alaska Science Center (Flint 2004) suggests that 44 percent of the molting brant in the TLSPA have used lakes over the last five years that would be available (in their entirety or in part) for leasing under the

Preferred Alternative. Since this area provides critical molting habitat for up to 30 percent of the population of Pacific brant, potential impacts to this population during their sensitive molting season could have substantial consequences to the Pacific Flyway population. Furthermore, the Pacific Flyway population is substantially below management objectives. Thus increased development in this area may place this population at significant risk. In addition to brant, 44 percent of white-fronted geese and 58% of Canada geese have also used lakes for molting that would become available for leasing and industrial development under the Preferred Alternative. ***(Comment No. 197617-085)***

Response To: Comment 197617-085

There is no dispute that the TLSA is a very important area for molting geese including both brant and white-fronted geese as well as other species. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of brant and other geese and wildlife to the potential impacts of oil development. Specific regulations address measures to mitigate potential increases in predation pressure on tundra nesting bird due to increases in predator populations. Other regulations establish setbacks from molting areas within which facilities may not be constructed. Regulations also address potential disturbance from vehicular and air traffic, pedestrians, noise, and habitat loss. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Because of the importance of the Teshekpuk Lake region to molting geese and other waterfowl, the Pacific Flyway Council has recommended (2 July 2004 letter to Henri Bisson) that the sensitive goose molting area should not be offered for leasing; it should not be open to the construction of roads, pipelines or other facilities and seasonal human activity in this area should be restricted. The Council also recommends that the Teshekpuk Lake Special Area be given permanent protection from future development. ***(Comment No. 197617-086)***

Response To: Comment 197617-086

These are legitimate recommendations.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Specific concerns: In the comparison of alternatives the draft IAP/EIS at 2-81 recognizes likely impacts to "small numbers of nesting birds." This analysis fails to clearly address the likely impacts of Alternatives B and C to the thousands of geese that molt north of Teshekpuk Lake ***(Comment No. 197617-087)***

Response To: Comment 197617-087

This issue was discussed in Table 2-3, and in Chapter 4.

Comment From: Environmental Coalition (Comment Letter No. 197617)

On p. 3-41, the draft IAP/EIS describes potential impacts to molting brant and uses a mean population number of 18,500 birds. However, the high number of molting brant is over 36,000 representing 30 percent of the Pacific Flyway Population. These numbers reflect a much more significant population and should be used here. The current language may result in an underestimate of potential impacts to this important population. Table 3-8 on p. 3-43 of the draft IAP/EIS summarizes abundance and density of selected birds in the NE Plan area. This table clearly underestimates the importance of the goose molting lakes north of Teshekpuk Lake. Tens of thousands of geese use this area and it is considered unique in the circumpolar Arctic. ***(Comment No. 197617-088)***

Response To: Comment 197617-088

Table 3-7 addresses your concerns regarding molting goose numbers. Additionally, the following information was

added to Section 3.3.6.3 Waterfowl, Brant in the EIS, "... although as many as 36,817 brant have been reported (Table 3-7). The Teshekpuk Lake Goose Molting Area may be the single most important area for molting brant and other geese in the Arctic, based on information in Mallek et al. (2003) and Malleck (2004)."

Comment From: Environmental Coalition (Comment Letter No. 197617)

On p. 4-381, paragraph 2, the draft IAP/EIS states "In the context of the ACP and North Slope, however, the amount of potential bird habitat that could be directly or indirectly impacted long term by oil and gas activities on the planning area and elsewhere on the North Slope would be small—approximately 0.3 percent of the ACP and 0.08 percent of the North Slope." In terms of potential impacts to birds, this statement is highly misleading. Birds do not use the Arctic coast in a uniform manner. They concentrate in optimal habitat for both nesting and molting. If there is substantial development in a high-density nesting or molting area, there could be significant population impact. For example, the Teshekpuk Lake molting goose area is unique in the circumpolar Arctic. If there was substantial development there, it could have significant population-level impacts to some populations such as Pacific brant. This analysis is seriously flawed. **(Comment No. 197617-090)**

Response To: Comment 197617-090

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of brant and other geese and wildlife to the potential impacts of oil development. Regulations establish setbacks from molting areas within which facilities may not be constructed which will help to prevent loss of critical habitats such as those in the goose molting area. Regulations also address potential disturbance from vehicular and air traffic, pedestrians, noise, and habitat loss. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Environmental Coalition (Comment Letter No. 197617)

On p. 4-386, the draft IAP/EIS states "The effects of future project infrastructure on bird populations, although additive to natural effects, would be expected to be less severe than those associated with previous Arctic oil field developments." This conclusion is flawed and misleading. There has never been a development in an area like the Teshekpuk Lake goose molting. This area is unique and highly valuable to molting geese including brant, white-fronted geese, Canada geese and snow geese. Derksen et al (1992) described this area as "...unique, and no other known area could replace this habitat for brant anywhere within the Alaskan Coastal Plain." Major industrial development in this area could displace molting geese and result in significant population-level impacts to some species (e.g., Pacific brant). We believe the superficial analysis and conclusion of this DEIS regarding birds is fatally flawed and may have been driven by a predetermined objective. **(Comment No. 197617-091)**

Response To: Comment 197617-091

See response to comment 197617-084 under Birds - Molting Geese

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Table 2-3, Pages 2-80 and 2-8 1. Effects on Birds: The draft acknowledges likely impacts to "small numbers of nesting birds," but does not address potential impacts to the thousands of geese that molt in lakes in areas proposed for leasing and development under Alternatives B and C. Effects on birds for alternatives B and C should include analysis and discussion of possible permanent displacement of molting geese. **(Comment No. 197618-040)**

Response To: Comment 197618-040

Sections 4.3.8, 4.4.8, and 4.5.8 dealt with impacts to geese that molt in areas that could be impacted by oil activities. These sections have been revised to provide additional information on impacts to geese from these activities, and this information has been summarized and included in Table 2-3, Effects to Birds.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

The last sentence of this paragraph states that the portion of habitat affected would be a small percentage of total habitat on the ACP. This statement is misleading because it does not consider the fact that birds are not evenly distributed across the ACP. Instead, molting geese in particular concentrate in specific habitats where leasing is currently closed, some or all of which would be made available for oil and gas leasing and development under alternatives B or C. Additionally, impacts to birds may not be related only to the amount of habitat affected (the development "footprint"), but to a somewhat larger area that includes the "zone of influence" of oil and gas activities that may impact birds beyond the development footprint, including development related disturbances such as increased air traffic. ***(Comment No.* 197618-100)**

Response To: Comment 197618-100

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of birds to the potential impacts of oil development including habitat loss and disturbance. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern. Pre-development studies may identify areas of habitat that are critical for particular species and subsequent Weiss prior to proposed development may stipulate further protective measures.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.8.8, Page 4-427, Relationship Between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity, Birds: This section should adequately describe the potential long-term consequences of encroachment into the Goose Molting. Area. ***(Comment No.* 197618-111)**

Response To: Comment 197618-111

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 4.8.8 Birds, "Brant may be more affected by aircraft traffic, particularly helicopters, than other species (Derksen et al. 1992). Disturbances that affect survival rates of brant or other species of concern could have long-term effects on populations."

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

The most important known goose molting area on the Arctic coast of North America and Siberia. Most notable are the large concentrations of molting Pacific brant, representing up to 30 percent of the Pacific Flyway population. Large numbers of Canada and white-fronted geese molt here as well. Breeding pairs of threatened spectacled eiders have been recorded at higher than expected densities north of Teshekpuk Lake. Other species, primarily shorebirds, geese, pintail ducks, and loons either breed, molt, or stage in relatively high numbers within 5 miles of the coast from the Ikpikpuk River to the Colville River delta. Critical calving, migration and insect-relief habitats for the Teshekpuk Lake Caribou Herd are found here, which provides most of the caribou harvested for subsistence by the Native villages of Atqasuk, Barrow, Nuiqsut and Wainwright. Teshekpuk Lake, the largest on the North Slope, provides a variety of freshwater habitats and the greatest diversity of fish species among sampled lakes within the Planning Area. ***(Comment No.* 197619CM-006)**

Response To: Comment 197619CM-006

Many of these points are mentioned in the EIS.

Comment From: State of Alaska (Comment Letter No. 197620)

Bird Use of the Goose Molting Area Only one small paragraph (Chapter 3, Affected Environment, Section 3.3.6.3, Waterfowl, Brant) I describes the use of the Goose Molting Area (GMA) north of Teshekpuk Lake by brant. Two

sentences for white-fronted geese and one sentence for Canada geese describe numbers of these birds in the GMA. One table (Table 3-7) records the number of geese using the GMA. Given the importance of h s area to geese for molting, as noted in the following paragraphs, a much more detailed and expansive discussion of the physical characteristics of the area, and the behavioral peculiarities of geese using this area, the energetic importance of using this area to geese is needed in this document. ***(Comment No. 197620-033)***

Response To: Comment 197620-033

See response to comment 197618-049 under Birds - Brant

Comment From: State of Alaska (Comment Letter No. 197620)

A detailed discussion of the potential effects of the various associated with oil and gas exploration and development to geese using the GMA also needs to be presented within the appropriate Environmental Consequences sections. ***(Comment No. 197620-034)***

Response To: Comment 197620-034

The potential effects of development and the relative impacts in the TLSA are discussed for each alternative

Comment From: State of Alaska (Comment Letter No. 197620)

Value of Waterfowl Resources Relative to Environmental Risks The integrity and security of this area for geese is of greater consequence than any other waterfowl habitat issue on the North Slope. At stake in the Teshekpuk Lake Special Area (TLSA) are the welfare of 50,000 geese, stability of continentally important goose populations, and the public values these geese provide from Canada to Mexico. The goose molting area of the NE NPR-A Planning Area is most critical for Pacific black brant. On average, this region supports 15 percent of the entire population (up to 30 percent in some years) for several months; it has been a long-term historical molting area for brant from all breeding grounds including the Yukon-Kuskokwim Delta (75 percent of Teshekpuk molters), North Slope, Canada, and Russia. Pacific black brant are important subsistence resources in northwest Canada, as well as along Alaska's west coast, and they provide valued hunting and viewing opportunities from British Columbia to Baja Mexico. ***(Comment No. 197620-035)***

Response To: Comment 197620-035

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may be require special protection or areas important to species of concern.

Comment From: State of Alaska (Comment Letter No. 197620)

The area is also the primary molting site for the North Slope segment of Mid-continent greater white-fronted geese (MCWFG). The presence of MCWFG in the TLSA has grown from less than 5,000 birds in the 1980s to an average of over 20,000 in the past 10 years; the highest count of 35,000 in 2002 approached 6 percent of the continental population. These geese provide subsistence and recreational hunting, and viewing from Alaska to Mexico and pass through four Canadian provinces and 32 states of the Mississippi and Central Flyways. ***(Comment No. 197620-036)***

Response To: Comment 197620-036

The importance of the TLSA to molting geese has been emphasized in the EIS. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife to the potential impacts of oil development. In addition it is likely that pre-development studies will identify

areas that may be require special protection or areas unimportant to species of concern.

Comment From: State of Alaska (Comment Letter No. 197620)

Behavioral Sensitivity of Geese Molting geese are extremely vulnerable to predation during the flightless period, and have adapted sharp behavioral responses to disturbance including high levels of alertness, immediate group action when any bird senses danger, and extensive movements away from potential threats. Although these responses are essential for survival, they consume precious time needed for intensive feeding and energy reserves that are at low ebb during the molt. As a consequence, geese seek unique environments where disturbance events are mild and/or infrequent to obtain both safety and nutrition. ***(Comment No. 197620-037)***

Response To: Comment 197620-037

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may be require special protection or areas unimportant to species of concern.

Comment From: State of Alaska (Comment Letter No. 197620)

On the North Slope, the distribution of molting geese reflects these needs. Although there are probably suitable large lakes south of Barrow, human activity and harvest inhibit establishment of molting traditions by geese. Brant and Canada geese that breed in the Prudhoe Bay oilfield seek isolation on the shores of Prudhoe Bay, on peripheral large lakes, or the Sagavanirktok River Delta during molt. Aggregations of white-fronted and Canada geese are found in large drained-lake basins in the Colville River Delta. ***(Comment No. 197620-038)***

Response To: Comment 197620-038

It is important to preserve and protect areas for geese in existing areas of development and to insure that impacts from future development do not negatively impact wildlife.

Comment From: State of Alaska (Comment Letter No. 197620)

Over evolutionary time scales, geese have developed strong traditional use of specific molting sites, and even to specific lakes, where each population aggregates in large numbers. The tradition of molt migration is taught to succeeding generations, and favorable molting sites become firmly established through successful experience. Strong traditions in geese for nesting, molting, and wintering areas are not readily established or changed. Although documentation of shifts in traditional goose distributions is limited, examples range from sudden responses to single events to large-scale changes in breeding and wintering areas over decades. Currently, the impacts of oil and gas development near Teshekpuk Lake are difficult to predict, because specific development scenarios are unknown and responses of molting geese to different sources of disturbance have not been studied sufficiently. ***(Comment No. 197620-039)***

Response To: Comment 197620-039

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may be require special protection or areas unimportant to species of concern.

Comment From: State of Alaska (Comment Letter No. 197620)

This unique ecological formation north and east of Teshekpuk Lake was selected as a traditional molting area by

geese for its physical attributes and plant communities. No other region of the North Slope, nor the Western Canadian Arctic, has this combination of: (1) large water bodies with persistent ice pans as sanctuary for flightless birds, (2) rich and extensive foraging habitats adjacent to the lakes, (3) relatively low densities of predators (and human harvest), and (4) proximity to coastal staging areas and migration paths. These characteristics provide essential protection and rich food resources for geese that are energetically stressed by molt and in critical need of nutrient reserves for migration. Traditional molting sites are a function of not only ecological attributes of the area, but also distance from breeding grounds, energetic budgets of individual populations and species, and concurrent use by other geese. ***(Comment No. 197620-041)***

Response To: Comment 197620-041

The importance of the TLSA to molting geese has been well documented. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may be require special protection or areas unimportant to species of concern. Some additions were made to the EIS to further emphasize the need to minimize disturbance to molting geese.

Comment From: State of Alaska (Comment Letter No. 197620)

Map 3-15, Goose Molting Lakes. The scale of this map should be expanded so that the figure depicts only the goose molting area and not the entire planning area. This will permit easier assessment of the number of birds using the lakes, particularly the smaller lakes. A map showing the Goose Molting Area of the preferred alternative overlying the goose molting lakes should be provided to visually depict the proportion of the molting lakes that would be open to leasing. ***(Comment No. 197620-063)***

Response To: Comment 197620-063

BLM chose to keep all maps at the same scale for consistency and to show the entire National Petroleum Reserve-Alaska.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Irreversible and Irretrievable Commitment of Resources, Section 4.9.8, Birds, Page 4-432. Potential loss of traditional molting areas within the GMA could have considerable impacts to populations, as similar physical habitat is apparently not available on the North Slope. ***(Comment No. 197620-100)***

Response To: Comment 197620-100

It is important to minimize or eliminate potential disturbance to molting geese in the TLSA. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may be require special protection or areas unimportant to species of concern.

Comment From: Mary Ann McCall (Comment Letter No. 197639)

For caribou and geese, the time spent near Teshekpuk Lake is highly sensitive. The geese are flightless during their energy-demanding molt and extremely vulnerable to disturbance by people and aircraft. ***(Comment No. 197639-003)***

Response To: Comment 197639-003

It is important to minimize or eliminate potential disturbance to molting geese and other wildlife. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate

the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may be require special protection or areas unimportant to species of concern.

Comment From: Brodie Anderson (Comment Letter No. 197976)

Furthermore, Teshekpuk Lake and many of the lakes nearby, the wetlands, comprise one of the most important wetland complexes in the circumpolar Arctic for tens of thousands of geese. They gather at Teshekpuk Lake to molt making it one of the most important goose molting habitats in the Arctic in the entire world. Disturbances associated with routine human activities in an industrial oilfield could displace molting geese and reduce their populations. That natural balance of the ecosystem can further be disrupted by the oilfields since attracted -- since they attract natural predators due to increased human activity, waste, garbage, and other activities. The predators, then, in turn, prey on the nesting birds and their eggs and young. ***(Comment No.* 197976-054)**

Response To: Comment 197976-054

Stipulations are in place to minimize the potential for increased levels of predation on tundra-nesting birds.

Comment From: Stan Senner (Comment Letter No. 197978)

The first item is that the description of molting geese in the Draft Environmental Impact Statement is inadequate and does not do justice to the importance of the area north of Teshekpuk as a molting area for brant. In fact, it even fails to mention that greater white-fronted geese are molting there and only makes reference to breeding birds. And simply does not do justice to the fact that for brant in particular, this is the single most important molting area in the entire circumpolar Arctic. Up to 30 percent of all Pacific fly away brant may be found there in any given year molting. And I think that needs more emphasis in the Draft EIS. ***(Comment No.* 197978-088)**

Response To: Comment 197978-088

The Draft EIS does indicate that white-fronted geese molt in the Teshekpuk Lake goose molting area--see Table 3-7. Some additions have been put into the EIS to reflect the importance of the area to brant.

Comment From: Stan Senner (Comment Letter No. 197978)

This then leads to the next point, and that is that the area proposed by BLM in Alternative B, would set aside 213,000 acres as a no lease zone. One of the things that biologists who have looked at the molting geese over the last 25 years have noticed that the distribution within that area, -- the distribution of molting geese within that area is not the same. It shifts over time, depending upon plant succession in these drained lake basins. The smaller the area that's set aside and where leasing is prohibited, the greater the probability in fact, that molting geese will not always be using that area. It's a little bit like setting aside a postage stamp-size reserve for -- to protect some value which may be in place now, and only 10, 20 or 30 years later, to discover that those conditions no longer pertain, and one's postage size reserve is no longer any good. So again, the smaller the area set aside that's free of oil industry infrastructure, the greater the probability that that will not be a value to the molting geese over time. ***(Comment No.* 197978-095)**

Response To: Comment 197978-095

Yes, the larger the size of the area set aside, the greater will be the benefit to birds and other wildlife.

TOPIC: BIRDS

ISSUE: MOVEMENTS

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Because of the importance of the Teshekpuk Lake area to molting geese and other waterfowl, the Pacific Flyway Council has recommended (2 July 2004 letter to Henri Bisson) that the sensitive goose molting area should not be offered for leasing nor should it be open to the construction of roads, pipelines or other facilities. Seasonal human activity in this area should be restricted. The Council also recommends that the TLSA be given permanent protection from future development. Based on these recommendations and consultation with waterfowl experts from state and federal agencies and university scientists, we concur that the TLSPA should be retained at its present size. ***(Comment No. 197610-054)***

Response To: Comment 197610-054

In developing the final Preferred Alternative, we have considered yours and others comments and have developed several stipulations specifically to protect resources in the Teshekpuk Lake Special Area. See K-3, K-4, K-5, K-6, K-8, K-9, K-10, and K-11.

TOPIC: BIRDS

ISSUE: RAPTORS

Comment From: The Wildlife Society (Comment Letter No. 191279)

First, several significant threats caused directly or indirectly by petroleum exploration and development in the region are not evaluated in the document. Examples include the disturbance of nesting raptors caused by exploratory geologists collecting samples from nesting cliffs, electrocution of raptors perching on power poles, and increased disturbance of nesting raptors resulting from extending the road network into the NPR-A to facilitate development. These threats should have been evaluated, and the prospect for increased development under the Preferred Alternative (Alternative B) to escalate their scale should have been addressed. ***(Comment No. 191279-017)***

Response To: Comment 191279-017

Stipulations have been established to that require power lines to be either underground or associated with pipelines. This should eliminate the possibility of raptor electrocution on power poles. Other stipulations require infrastructure to be located away from the vicinity of nesting raptors. The IAP/EIS also addresses the potential for disturbance from summer camps related to non-oil and gas activities.

Comment From: Brodie Anderson (Comment Letter No. 197976)

The Colville River is home to phenomenal numbers of raptors that utilize the cliffs for nesting. One of the healthiest populations of the peregrine falcons in the world uses these ledges and cliffs to raise their young. These raptors are very susceptible to disturbances associated with industrial oil development. ***(Comment No. 197976-055)***

Response To: Comment 197976-055

Stipulations associated with the Colville River Special Area are designed to minimize the potential effects of development on nesting peregrines and other raptors.

TOPIC: BIRDS

Comment From: Veronica Estelle (Comment Letter No. 196456)

As a specialist on shorebirds (Charadriidae and Scolopacidae), I am deeply concerned about the development of this vast and critically important Arctic breeding ground. This group of birds faces global population declines currently. Up to 36% of all species of shorebirds have statistically significant declining population trends. Habitat modification and loss is now considered the primary cause of detriment to these species. Oil drilling, exploration, and extraction within the NPR-A represents an untested and uncertain challenge to their use of this area for breeding. While reading the EIS it was surprising to me that there was a lack of consideration of shorebird species in development planning. There also was an absence of anything that addressed the conservation status of these birds or a plan about how oil companies who extract oil will mitigate for loss or compromise of breeding habitat for these and other wildlife species. I am especially disappointed and disheartened in these omissions. **(Comment No. 196456-003)**

Response To: Comment 196456-003

It is true that the vast area being considered supports millions of shorebirds. The assessment of impacts to shorebirds was based on the results of numerous studies conducted in existing oil fields and pre-development studies in the National Petroleum Reserve-Alaska. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of birds to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern such as buff-breasted sandpiper and bar-tailed godwit. Some additions were made to the EIS to emphasize some of the areas important to shorebirds.

Comment From: Veronica Estelle (Comment Letter No. 196456)

I am concerned that the BLM has not supported a rigorous enough ecological assessment of the impacts of oil development in the NPR-A, northwest or northeast sectors. Because of the conservation status of the shorebirds that breed in the NPR-A, particularly the Golden Plover and Bar-tailed Godwit, I am concerned that their needs are not being addressed adequately in this planning process. I hope that you will not respond by saying that all species cannot be considered, as this group of birds is unique, ecologically important, and has different habitat requirement that the few species of geese and ducks that have been included in the EIS. **(Comment No. 196456-004)**

Response To: Comment 196456-004

It is true that the area being considered is very important for numerous shorebird species including not only golden plover and bar-tailed godwit, but also other species of concern such as buff-breasted sandpiper. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of birds to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern. Some additions were made to the EIS regarding the status of some of these species of concern and the importance of the TLSA to them.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Shorebirds: Shorebirds are the most numerous of the bird communities that inhabit the Northeast NPR-A (BLM 1998). Up to 17 species of shorebirds, numbering up to 2.8 million occur in NPR-A Northeast Planning Area. The TLSPA contains some of the highest densities of shorebirds within the planning area. Although oil field impact studies of shorebirds are few, certain species have been shown to exhibit a negative response to oil field development. For example, a roadside versus non-roadside survey showed that 7 of 8 shorebird species had lower nest densities or breeding counts in areas adjacent to roads compared to roadless areas (Troy 1993). Shorebird species with lower densities near roads included golden plover, semipalmated sandpiper, pectoral sandpiper, dunlin, stilt sandpiper, buff-breasted sandpiper and red phalaropes. Densities of red-necked phalaropes were higher near roads, perhaps in

response to their use of thermokarst areas. ***(Comment No. 197610-091)***

Response To: Comment 197610-091

This point is included in the discussion of activities on roads and pads in the Consequences section under Alternative A.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

We will briefly summarize information on the buff-breasted sandpiper as an example of our concern for shorebirds in Northeast NPR-A. The buff-breasted sandpiper numbered in the millions a century ago, fell to near extinction in the 1920s (Lanctot and Laredo 1994), and is estimated at approximately 15,000 today (Brown et al. 2001). The buff-breasted sandpiper is one of three top Conservation Priority Species identified by the Alaska Shorebird Working Group and is a Species of High Concern in the US Shorebird Plan (Brown et al. 2001). ***(Comment No. 197610-092)***

Response To: Comment 197610-092

Most of this information is contained in the EIS in the description of the affected resources.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

High densities of shorebirds breed in area north, northeast and west of Teshekpuk Lake within the current no-lease zone. Because oil facilities are typically placed on drier upland tundra where buff-breasted sandpipers nest and remain to rear broods, the effects of habitat loss and enhanced predation may be more pronounced on buff-breasted sandpipers than other shorebird species. Protection from development of coastal corridor habitats (for pre-migratory staging and feeding) and near shore marine spill events may be highly important for avoiding impacts to the population of buff-breasted sandpipers. The high level of breeding range overlap with current and potential oil development in the NPR-A predisposes this species to significant cumulative impacts from the effects of oil development. Oil field development may reduce sandpiper populations through habitat loss, fragmentation, and enhanced predation (Meehan 1986, Martin 1997, Day 1998). ***(Comment No. 197610-093)***

Response To: Comment 197610-093

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of tundra nesting birds and other wildlife to the potential impacts of oil development. Specific regulations address measures to mitigate potential increases in predation pressure on tundra nesting bird due to increases in predator populations. Setbacks have also been established in coastal areas within which permanent facilities may not be established. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern such as buff-breasted sandpiper.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.2.1, Pages 2-5 and 2-6, Areas with Additional Protections: A discussion of other species of management concern may be appropriate here. There are large numbers of shorebirds that occupy the Northeast Planning Area, including a number of Birds of Conservation Concern (BCC) species that occur in the area that are not monitored or actively avoided (see General Comments, Other Species of Management Concern; and comments below relative to pages 3-34 and 3-36). ***(Comment No. 197618-018)***

Response To: Comment 197618-018

The importance of the Planning Area to provide important breeding habitat for several species of shorebirds, including Birds of Conservation Concern, was included in Section 2.2.1.4.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Effects of oil and gas development on shorebirds are frequently suggested to have minor negative consequences on a species. Although such statements may be true when developments are viewed independently, the cumulative effects from many developments may have more than "minor" negative effects on a given species. This may be particularly true for species that use the drier habitats within NPR-A. Such areas, frequently selected as sites for pads, pipelines and roads as managers attempt to avoid wetland sites, may be relatively limited and locally more important to some species compared to adjacent wetland areas. In the Northeast Planning Area, these drier areas are selected by buff-breasted sandpipers, a BCC species, and they may be used as migratory pathways by the Teshekpuk Lake Caribou Herd. ***(Comment No.* 197618-043)**

Response To: Comment 197618-043

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 4.3.8.2 Oil and Gas Exploration and Development Activities, Habitat Losses and Alteration, Permanent Habitat Loss, "In addition, there may be a functional loss of habitat in areas near roads and pads if development-related disturbances preclude birds from utilizing these habitats. Impacts related to habitat loss may be more severe for species that have specific habitat requirements or are species of special concern due to low population numbers, such as buff-breasted sandpipers that use dry, upland sites, should these sites be lost due to gravel placement."

Additionally, the following information was added to Section 4.4.8.2 Oil and Gas Exploration and Development Activities, Effects of Disturbances, Habitat Losses and Alterations, "Permanent habitat loss under the Preferred Alternative could potentially have greater impact on tundra-nesting birds than under the No Action Alternative because of the increased amount of habitat loss under the Preferred Alternative and because some areas of high bird use that are closed to development under the No Action Alternative would be open to leasing under the Preferred Alternative. Birds that use drier habitats may be more affected by habitat loss than those that use wet habitats because less dry habitat is available in the National Petroleum Reserve – Alaska. Loss of dry habitat could be especially important for buff-breasted sandpiper, which is a species of concern with low population numbers that uses dry

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

3.3.6.4, Pages 3-44 to 3-46, Shorebirds: This section is missing several key points that are described below: A bird monitoring study conducted between 1998 and 2001 surveyed 386 various-sized plots distributed throughout the NPR-A, which together covered a 1 12-km2 area (B. Andres and J. Bart, unpubl. data). These surveys were conducted initially along rivers but during the last two years of the study helicopters were used to survey random locations throughout NPR-A. The surveyed area represents about 0.47% of the approximately 24,000 km2" P R - A area. Biologists counted 4,445 shorebirds belonging to 17 species during the four survey years. The highest counts of shorebirds occurred in the northern portion of NPR-A, followed by areas near the Colville River, and then the southern portion of NPR-A. The most numerous species were Semipalmated Sandpiper (1 153), Pectoral Sandpiper (9431, Red Phalarope (6691, Red-necked Phalarope (435), Long-billed Dowitcher (353), and Dunlin (343). Other less common species included Black-bellied Plover, American Golden-plover, Whimbrel, Bar-tailed Godwit, Ruddy Turnstone, Western Sandpiper, White-rumped Sandpiper, Baird Sandpiper, Buff-breasted Sandpiper, Stilt Sandpiper, and Wilson's Snipe. Seven of the species (in bold above) are on the USFWS's National or Alaska BCC list (see details below as to why these species are considered of high conservation concern). A preliminary analysis that extrapolated the densities of the most abundant shorebirds (based on a double sampling approach used to determine detection rates) using the Duck's Unlimited land cover information in a regression model estimated that between 356,000 and 455,000 (95% Confidence Intervals) shorebirds occurred on the eastern portion of the NPR-A. ***(Comment No.* 197618-053)**

Response To: Comment 197618-053

We did not have access to this unpublished data. We recently received a preliminary report by Andres on this work and have incorporated some of this information into the EIS.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

The large number of shorebirds that occur in the NPR-A should not be used as a reason for arguing that oil development has little affect on the species at a population level. Cumulative effects from many developments over a large area could have a negative impact on less common species, especially when facilities and roads are built in their preferred habitat. Local extirpation for particular species might also be an issue if specific habitats become substantially reduced or eliminated. ***(Comment No. 197618-054)***

Response To: Comment 197618-054

While impacts may result in displacement of small numbers of individual birds or pairs, impacts are usually discussed at the population level. It is true that the area being considered is very important for large numbers of shorebirds.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Based on the type, distribution and quantity of habitat available in northern Alaska, the NPR-A ranks the highest in terms of shorebird diversity and abundance (R. Lanctot, unpubl. data). Indeed, habitat availability alone indicates the number of shorebirds in NPRA likely dwarfs the number present on the Kuparuk/Prudhoe Bay oil field, and the Arctic National Wildlife Refuge. ***(Comment No. 197618-055)***

Response To: Comment 197618-055

There is no dispute that the National Petroleum Reserve-Alaska is an important area for shorebirds.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Shorebirds breeding on the NPR-A migrate to many parts of the world, including Japan and Asia (Dunlin), New Zealand (Bar-tailed Godwit), southern South America (e.g., Pectoral Sandpiper, American Golden-plover, White-rumped Sandpiper, Buff-breasted Sandpiper), Central America (e.g., Western Sandpiper, Semipalmated Sandpiper), and the east coast of North America (Rednecked Phalarope). Such long-distance migrations are energetically expensive and the ability of these birds to acquire sufficient fat reserves on the tundra and littoral areas of the NPR-A are crucial to their accomplishing such migrations. ***(Comment No. 197618-056)***

Response To: Comment 197618-056

There is no dispute that tundra and littoral habitats on the North Slope are important for migrating shorebirds.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

While some of the international significance of these species is presented in the document, the ramifications of this are not clearly presented. For example, it should be noted that shorebirds (and many other birds) are affected by human actions throughout their breeding, staging, migration, and wintering ranges. Thus we cannot view any negative, although frequently argued as only subtle, habitat alteration on the breeding grounds independently, but rather such actions must be viewed from a global perspective (i.e., our actions may be just one of many). ***(Comment No. 197618-057)***

Response To: Comment 197618-057

Many of these issues are discussed the section on cumulative impacts.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

American Golden-Plover-Despite a population of moderate size for a migratory shorebird (1 50,00O+, Morrison et

al. 2001), this is a species of high concern because of an apparent population decline and significant potential threats on the non-breeding grounds (Brown et al. 2001). Among the latter, changing agricultural practices at spring staging areas in Indiana and Illinois, exposure to agricultural pesticides during much of the spring migration in North America, and the loss of suitable habitat on the non-breeding grounds in South America are probably the most important (Johnson 2003). ***(Comment No. 197618-059)***

Response To: Comment 197618-059

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section, 4.6.9.8 Cumulative Analysis, "Habitat losses in non-breeding areas could be particularly significant for species of concern or species with low population numbers, such as buff-breasted sandpiper. Habitat losses may occur directly from habitat destruction due to development, or from pollution, such as exposure to agricultural pesticides that may reduce the ability of birds to reproduce or may cause direct mortality to birds."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Whimbrel-The second edition of the U. S. Shorebird Conservation plan provides separate conservation assessments for the two known North American races of Whimbrel. The Canadian form, Numenius phaeopus hudsonicus, is highly imperiled, but the Alaskan form, N.p. rufiventris (Gibson and Kessel 1997, Engelmoer and Roselaar 1998), is considered to be of only moderate concern (Brown et al. 2001). The US. Plan prioritization, however, does not take into account the rapid elimination of much of the intertidal mangrove habitat used extensively by Whimbrels in Latin America during the non-breeding season (Mallory 1981; Skeel and Mallory 1996; P. O'Hara, pers. comm.). Consideration of this potential threat to both races elevates the prioritization score of rufiventris (the Alaskan race) to a 4 (high concern). There may be as many as 40,000 Whimbrels in Alaska (Morrison et al. 2001, Brown et al. 2001). Published estimates of density in Alaska, however, are low (McCaffery 1996, Skeel and Mallory 1996), and the largest Alaskan concentrations involve only a few thousand birds (Handel and Dau 1988). Population trends, migration routes and non-breeding destinations of Alaska breeding Whimbrels are unknown. ***(Comment No. 197618-060)***

Response To: Comment 197618-060

The fact that regulated or non-regulated development in wintering areas and along migratory routes may negatively impact birds is mentioned in the section on Cumulative Impacts.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Bar-tailed Godwit-Alaska may support the entire breeding population of Limosa lapponica baueri. Despite having a moderate population size (~120,000 birds), this population is potentially at risk. The species is vulnerable to subsistence harvest throughout its annual cycle. A few thousand godwits are harvested annually on the Yukon-Kuskokwim Delta; a harvest of similar magnitude apparently occurs in China, and the indigenous Maori of New Zealand have recently petitioned their government to legalize harvest there. The absolute levels of such harvest and their cumulative impacts on the population are largely unknown but could be significant. In addition, post-breeding surveys on the Yukon Kuskokwim Delta suggest that large-scale reproductive failures have occurred repeatedly during the past five years; juveniles have made up no more than 3% of staging flocks (McCaffery and Gill 2001 ; McCaffery and Gill, unpubl. data). Even lower proportions have been detected among birds arriving in fall on the non-breeding grounds of New Zealand and eastern Australia. Finally, limited data suggest that clutch size has declined significantly over the last century (McCaffery, unpubl.); this may contribute to the low numbers of juveniles seen on the fall staging grounds. ***(Comment No. 197618-061)***

Response To: Comment 197618-061

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 4.6.9.8 Birds, Cumulative Analysis, "Impacts related to bird hunting in wintering areas and along migratory routes can be additive to the effects on the North Slope. Impacts of subsistence hunting may impact species of concern such as brant, bar-tailed godwit, and threatened eiders as well as many more abundant species."

The following information was also added to Section 4.6.9.8 Birds, Cumulative Analysis, "Some evidence suggests that habitat fragmentation produced by gravel structures in oil fields may cause reductions in shorebird densities for some species (Meehan 1986) although Troy (1988) found little evidence that fragmentation of tundra habitats affected bird use of areas surrounded by oil field infrastructure. Gravel roads may provide easier access to tundra bird habitats for predators such as Arctic fox."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Ruddy Turnstone-At the species level, the Ruddy Turnstone is considered a species of high concern in the U. S. Shorebird Conservation Plan (Brown et al. 2001). The population in eastern North America (Arenaria interpres morinella) is thought to be declining overall, and has declined significantly in two major survey areas (Donaldson et ali. 2001). As such, this population independently qualifies as one of high concern. Ruddy Turnstones breeding along the Beaufort Sea coast of Alaska show affinities with morinella, but the taxonomic status of birds in this region of the state is unclear (Gabrielson and Lincoln 1959, Engelmoer and Roselaar 1998). Most Alaskan breeders apparently belong to the nominate race, A. i. interpres. Although the U.S. Plan indicates that this species is of only moderate conservation score, interpres actually qualifies as a population of high concern according to the quantitative criteria in the plan. The estimated population size of this Alaskan population is only 20,000, but the quality of that estimate is poor (Brown et al. 2001). The population trend and non-breeding areas of Alaskan Ruddy Turnstones are unknown. Although thousands formerly congregated on the Pribilof Islands each fall to feed on the maggots infesting slaughtered fur seals, those numbers have declined dramatically since the cessation of the seal harvest. This phenomenon involved both Siberian- and Alaskan-breeding birds (Thompson 1974), but in what proportions is not known. ***(Comment No.* 197618-062)**

Response To: Comment 197618-062

We appreciate your comments regarding ruddy turnstones. The EIS briefly discusses the distribution and habitat use of some bird species that occur commonly or regularly in the area. Because of the large number of shorebird species, shorebirds were treated as a group with specific information on individual species in some cases. The fact that ruddy turnstone is considered a species of concern was added to the EIS.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Dunlin-Two subspecies of Dunlin (Calidris alpina arcticola and C. a. pacifica) nest in Alaska, the former exclusively while a very small fraction of the latter occasionally nests east into Canada (Warnock and Gill 1996). The population size of C. a. arcticola is < 650,000 (D. Troy, pers. comm.). Despite the large population size, this race is considered highly imperiled (Brown et al. 2001) because significant declines have been documented in a local population on the North Slope (D. Troy, pers. comm.), and non-breeding habitat in East Asia continues to be lost at an alarming rate (Barter 2003). The estimated population size of C. a. pacifica is also large, at 550,000. Similar to arcticola, however, this species is of high conservation concern because of probable population declines, significant threats during the non-breeding season (e.g., extreme concentrations near oil shipping lanes in Prince William Sound) and its small breeding range (Brown et al. 2001). ***(Comment No.* 197618-063)**

Response To: Comment 197618-063

Thank you for your comments on dunlin. The following information from this comment was added to Section 3.3.6.4 Shorebirds, Dunlin, "Habitat loss on Asian wintering grounds may be contributing to declines in dunlin populations."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Buff-breasted Sandpiper-The Buff-breasted Sandpiper is a species of high conservation concern because of its apparent decline from historical numbers, small population size (1 5,000), small non-breeding distribution, and probable threats on the non-breeding grounds (Brown et al. 2001, Morrison et al. 2001). Threats on the non-breeding grounds include habitat loss along the migration route, exposure to pesticides, and resort and agricultural

development of remaining habitat used during the austral summer in South America (Lanctot and Laredo 1994, Gotthardt and Lanctot 2002). ***(Comment No. 197618-064)***

Response To: Comment 197618-064

See response to comment 197618-059 under Birds - Shore Birds

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

3.3.6.4, Pages 3-44, Sandpipers and Phalaropes: Several of these species have populations that can increase and decrease substantially from year-to-year. Most notable are pectoral sandpipers and buff-breasted sandpipers, which can be completely absent from an area one year and very abundant the next (Lanctot and Weatherhead 1997, Holmes and Pitelka 1998). These species cannot be adequately monitored in one or even two-years. ***(Comment No. 197618-065)***

Response To: Comment 197618-065

There is agency concern regarding the potential for development to impact shorebirds and other bird species. Numerous studies have been conducted over the past 30 years in existing oil fields to document the effects of development on shorebirds. Should development occur in the National Petroleum Reserve-Alaska it is likely that pre-development studies would be conducted to identify areas and species of concern and to establish mitigation to protect birds in general and species of special concern.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

3.3.6.4, Pages 3-46, Buff-breasted Sandpiper: The distribution of buff-breasted sandpipers, and most other shorebirds, is poorly known on the Arctic Coastal Plain. Thus the lack of observations of this species from the NPR-A does not mean the species does not occur or that it occurs uncommonly in the region. The ramifications of the species' lek-mating system are also not mentioned. Leks are areas where males aggregate and females visit to mate. Thus the availability of these meeting areas, usually located in dry areas adjacent to river banks, is essential for the species to breed successfully. These drier sites are typically selected for oil and gas development to avoid the much more common wetland areas. The principal wintering areas for buff-breasted sandpipers are in coastal Brazil, Uruguay and Argentina (Lanctot et al. 2002). ***(Comment No. 197618-066)***

Response To: Comment 197618-066

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.6.4 Shorebirds, Buff-breasted sandpiper, "Leks are areas usually located in drier upland areas where males congregate to attract females."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Map 3-19: This map depicts shorebird distributions across the NPR-A based on aerial breeding pair surveys. This map is likely inaccurate for several reasons. First, these surveys were designed to sample waterfowl and thus transect methods are likely inappropriate for shorebirds (even large ones) that are difficult to see and seldom fly up while planes are flying over. Second, shorebirds are counted opportunistically (i.e., when duck numbers are not overwhelming the observers). We recommend using data from the more accurate ground-based surveys described above. ***(Comment No. 197618-070)***

Response To: Comment 197618-070

We inquired about the availability of reports based on the double-sampling shorebird surveys but it was our understanding that reports were not available at the time the EIS was written. We recently were able to acquire a

preliminary report on these studies and have incorporated some of the results into the EIS.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.8.2, Page 4-205, Effects of Disturbance, Oil and Gas Development, Watercraft: Watercraft use along rivers could affect some bird species that rely almost strictly on gravel bars and shrubs that occur along the streams. Among the shorebirds, such species include Semipalmated Plovers, Baird's Sandpipers, and Ruddy Turnstones. Repeated displacement of these birds could result in failure to nest, abandonment of nest sites, and generally lower productivity. ***(Comment No. 197618-082)***

Response To: Comment 197618-082

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 4.4.8.2 Oil and Gas Development, Activities, Air Traffic of the EIS, "Disturbance from watercraft activity along rivers could affect birds such as ruddy turnstones, semipalmated plovers, and Baird's sandpipers that use gravel bars. The results of disturbance may include failure to nest or nest abandonment."

Comment From: USFWS Anchorage (Comment Letter No. 197619)

In general, the DEIS needs further information on the importance of the Planning Area to shorebirds, and the potential impacts of oil and gas development on shorebirds. The DEIS concludes that oil leasing and development would likely have only minor impacts on shorebirds. Although such statements may be true when developments are viewed independently, the cumulative effects from many developments may have more than minor negative effects on a given species. This may be particularly true for species that use the drier habitats within the NPR-A. Such areas, frequently selected as sites for pads, pipelines and roads as managers attempt to avoid wetland sites, may be relatively limited and locally more important to some species compared to adjacent wetland areas. In the Northeast Planning Area, these drier areas are selected by buff-breasted sandpipers, a Species of High Conservation Concern (Brown et. al. 2001). Other species of Conservation Concern that occur in the NPR-A include American golden plovers, ruddy turnstones, sanderlings, red knots, bar-tailed godwits, and whimbrels. ***(Comment No. 197619-026)***

Response To: Comment 197619-026

The use of drier habitats by buff-breasted sandpipers is pointed out in several places in the EIS. Additionally, the following information was added to Section 4.3.8.2 Oil and Gas Exploration and Development Activities, Habitat Losses and Alteration, Permanent Habitat Loss, "In addition, there may be a functional loss of habitat in areas near roads and pads if development-related disturbances preclude birds from utilizing these habitats. Impacts related to habitat loss may be more severe for species that have specific habitat requirements or are species of special concern due to low population numbers, such as buff-breasted sandpipers that use dry, upland sites, should these sites be lost due to gravel placement."

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Many species of shorebirds are highly site faithful, and loss or alteration of traditional breeding sites may prevent these birds from breeding successfully. Thus, displaced birds may become part of the nonbreeding portion of the population, resulting in reduced productivity and lower recruitment rates. Cumulative effects from many developments over a large area could have a negative impact on less common species, especially if facilities and roads are built in their preferred habitats. Most shorebirds occur in lower-than-expected densities adjacent to oil field roads (Troy 1993, 2000), and snow drifts and impoundments adjacent to oil field facilities during nest initiation can displace shorebirds from formerly suitable nesting. If additional leasing results in development of new oil fields, impacts to shorebirds will increase. Shorebird breeding densities in NPR-A tend to exhibit a coastal gradient, with higher densities nearer the coast compared to inland areas (Andres 2004), and concentrations of staging shorebirds are most notable at coastal locations, particularly north and east of Teshekpuk Lake. Development within the TLSA will have disproportionately greater effect than development further inland. Concerns are greatest for those species that are declining and are found in greater than average abundance in the TLSA, including dunlin, red phalarope,

and ruddy turnstone (Andres 2004). ***(Comment No. 197619-027)***

Response To: Comment 197619-027

Many of your points have been mentioned in the EIS. The following information was added to Section 4.3.8.2 Oil and Gas Exploration and Development Activities, Effects of Disturbance, Exploration, "Higher shorebird densities may occur in areas near the coast compared to inland areas and disturbance that occurred in coastal areas may have a greater impact on shorebirds than inland disturbances."

Comment From: State of Alaska (Comment Letter No. 197620)

Map 3-16, Onshore Density of Pintails. Same comments as Map 3-10.Map 3-17, Onshore Density of Long-tailed Ducks. Same comments as Map 3-10.Map 3-18, Onshore Density of King Eiders. Same comments as Map 3-10.Map 3-19, Onshore Density of Large Shorebirds. Same comments as Map 3-10. ***(Comment No. 197620-065)***

Response To: Comment 197620-065

The maps have been revised to reflect your comments.

TOPIC: BIRDS

ISSUE: WATERFOWL

Comment From: Ned Egen (Comment Letter No. 125270)

I understand that if this area is opened to oil development the existence of thousands of waterfowl and caribou, tens of thousands of birds, including brant, greater white-fronted geese, Canada and Snow geese becomes vulnerable. ***(Comment No. 125270-003)***

Response To: Comment 125270-003

It is true that the Planning Area is important for a wide variety of wildlife. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: patriotic US citizen (Comment Letter No. 149424)

TEEMING WATERFOWL Perhaps the most astonishing feature of the area, though, is its waterfowl. GEESE in the tens of thousands come to the area: BRANT, greater white-fronted, Canada and snow GEESE. The geese, including as many as 30 percent of all Pacific black brant, seek these remote wetlands for safety during a very vulnerable time: molting season when the birds are flightless. The Interior Department's own data, gathered between 1999 and 2003, report that an average of 47 percent of the brant and 44 percent of the white-fronted geese now molt on waters that would be open wholly or partly under the administration's proposal. ***(Comment No. 149424-009)***

Response To: Comment 149424-009

See response to comment 191279-003 under Birds

Comment From: Wallace Elton (Comment Letter No. 182141)

Many other species of waterfowl, including Tundra Swans from my part of the country and several other Watch List species, nest in the area. All of these species would be at risk from habitat loss and degradation and disturbance under the preferred alternative. In addition, as noted by the National Research Council last year, there would be a marked increase in nest predation as a result of oil and gas development. **(Comment No. 182141-004)**

Response To: Comment 182141-004

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife to the potential impacts of oil development, including the potential for increased effects of predation due to increases in predator numbers.

Comment From: Ducks Unlimited (Comment Letter No. 196943)

Northern pintail regularly use this area when southern prairies face drought. Large concentrations of pintails use TLSA and the coastal plain during such conditions. Pintail populations are well below management objectives and areas important to this species must be protected. Up to 35,000 white-fronted geese molt and stage in the TLSA. Tundra swans, spectacled eider, greater scaup, and American pigeon use these lacustrine wetlands. **(Comment No. 196943-009)**

Response To: Comment 196943-009

There is concern about potential impacts of oil development in TLSA to brant and other waterfowl species including northern pintail. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of brant, northern pintail and other waterfowl to the potential impacts of oil development. It is true that the area being considered is very important for pintails. In addition it is

Comment From: Pacific Flyway Council (Comment Letter No. 196949)

Waterbirds that depend on NPR-A habitats, particularly waterfowl, are of high value to a wide range of constituents from Russia, Arctic Canada, Alaska, Pacific coast states, and Mexico. White-fronted geese, pintails, and tundra swans are important resources that move through the Central and Mississippi Flyways as far as Mexico. These migratory birds are highly valued for subsistence and recreational hunting, viewing, and education across most of North America. **(Comment No. 196949-007)**

Response To: Comment 196949-007

There is concern about potential impacts of oil development in TLSA to waterfowl. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and nesting waterfowl to the potential impacts of oil development.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Nesting pairs of greater white-fronted geese are dispersed singly or in loose aggregations throughout the NPR-A (BLM 1998). Some higher densities are found adjacent to Teshekpuk Lake, the Kogru River, and Cape Halkett (Mallek et al. 2001) (see map of nesting density in Audubon Alaska 2002). **(Comment No. 197610-083)**

Response To: Comment 197610-083

White-fronted goose distribution is displayed on Map 3-14. The areas mention in your comment are displayed on this map.

Comment From: Mark Udall, Congress of the United States (Comment Letter No. 197613)

These waterfowl are important to many throughout North America. The native Alaskans rely on MANY species for subsistence. Additionally, these migratory birds are important to recreational hunting, viewing and education. Any oil and gas activities that will negatively effect the populations of the migratory birds that depend on the NPR-A should be prevented. ***(Comment No. 197613-003)***

Response To: Comment 197613-003

There is concern about potential impacts of oil development in TLSA to brant and other waterfowl species. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and nesting waterfowl to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

3.3.6.3, Page 3-40, Swans and Geese, White-fronted Goose: White-fronted geese on the Arctic Coastal Plain (ACP) belong to the Mid-Continent Population, which winters on the coasts of Louisiana and Texas and on the coast and central highlands of Mexico. While numbers of white-fronted geese summering on the ACP appear to have increased since 1985, the population as a whole has declined significantly in recent years (Neiman et al. 2003) and additional harvest restrictions may be required. ***(Comment No. 197618-048)***

Response To: Comment 197618-048

The Final IAP/EIS has been revised in consideration of your comments. The following information from this

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

3.3.6.3, Pages 3-41 to 3-43, Ducks: While no significant trends are apparent in northern pintail numbers recorded on Service aerial surveys, the ACP represents one of the very few areas within the species' range where numbers are stable. Range-wide, pintail numbers are at approximately 50% of continental population objective level (USFWS 2003), and pintail population restoration represents one of the major waterfowl management challenges in North America today. Similarly, the continental long-tailed duck population has declined dramatically in recent decades (Trost and Drut 2003), and the ACP is the only surveyed breeding area that has not exhibited long-term declines. This may not necessarily reflect the long-term health of the ACP segment of the population; rather it may be, in part, because much of the decline observed elsewhere occurred prior to the initiation of surveys on the ACP. It should also be noted that common eiders have exhibited declines similar to those observed in king eiders (Suydam et al. 2000). ***(Comment No. 197618-051)***

Response To: Comment 197618-051

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.6.3 Waterfowl, Ducks, Northern Pintail, "Although no significant population trends are evident on the ACP, northern pintail populations in many other areas have displayed significant declines (USFWS 2003)." The following information was also added to Section 3.3.6.3 Waterfowl, Ducks, Northern Pintail, "Over their entire range, long-tailed ducks have shown declining population trends." Additionally, the following information was added to Section 3.3.6.3 Waterfowl, Common eiders, "Suydam et al. (2000) reported declining numbers of common eiders in the Barrow area in recent years."

Comment From: USFWS Anchorage (Comment Letter No. 197619CM)

Additionally, a large area immediately north and west of Fish Creek supports the largest high density nesting area for

king eiders on the North Slope of Alaska. The Service is concerned about the status of the king eider because counts of flocks migrating past Barrow have declined by approximately 50 percent since the mid-1970s. **(Comment No. 197619CM-009)**

Response To: Comment 197619CM-009

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife including king eiders to the potential impacts of oil development. Specific regulations address measures to mitigate potential increases in predation pressure on tundra nesting bird due to increases in predator populations. Other regulations establish setbacks from molting areas within which facilities may not be constructed. Regulations also address potential disturbance from vehicular and air traffic, pedestrians, noise, and habitat loss. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: State of Alaska (Comment Letter No. 197620)

Map 3-1 3, Onshore Density of Tundra Swan. Same comments as Map 3-1 0. **(Comment No. 197620-061)**

Response To: Comment 197620-061

Actual numerical densities were not provided by our cited source.

Comment From: State of Alaska (Comment Letter No. 197620)

Map 3-14. Onshore Density of Greater White-fronted Geese. Same comments as Map 3-10. **(Comment No. 197620-062)**

Response To: Comment 197620-062

Actual numerical densities were not provided by our cited source.

Comment From: State of Alaska (Comment Letter No. 197620)

The figures depicting the mean annual counts of brant, greater white-fronted geese, and Canada geese in the 1998 plan (Figures III.B.4-8,4-10,4-11) should be included in this current document to allow assessment of the relative use of the Goose Molting Area by each of these species. **(Comment No. 197620-064)**

Response To: Comment 197620-064

The relative use of the goose molting area by each species is depicted in Table 3-7.

Comment From: Inupiat Community of the Arctic Slope (Comment Letter No. 197638)

The area that is being considered, is identified as a sensitive area which requires heightened protection from potential impacts of oil & gas development and operation, especially the endangered waterfowl that nest, molt, and rear their young in the area that is being considered for leasing in the future: Steller's, Spectacled Eider, Oldsquaw ducks. These geese species that inhabit the Teshekpuk Lake that also nest, molt, and rear their young in the area will be impacted by an oil and gas development. **(Comment No. 197638-003)**

Response To: Comment 197638-003

See response to comment 197620-039 under Birds - Molting Geese

TOPIC: CABINS AND CAMPS

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The use and enjoyment of cabins and campsites must be protected. The EIS must analyze how any change in management is likely to affect cabin and campsite users. Buffer zones prohibiting surface facilities around all established cabins and campsites must be maintained. Whether structures exist on these sites, and regardless of their legal status, they must be recognized as subsistence use sites critical to the nutritional and cultural well-being of our residents. The issue must be clearly highlighted in the document. **(Comment No. 196407-018)**

Response To: Comment 196407-018

See response to comment 197617-045 under topic Basic Assumptions. Additional information on how management actions under the alternatives would affect cabins and campsites has been included in Sections 4.3.13.2, 4.4.13.2, and 4.5.13.2, Sociocultural Systems.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-27, K-1: the requirement that an increased setback of permanent facilities from certain water bodies where "subsistence cabins and campsites are numerous" must be defined with reference to specific locations within the planning area. **(Comment No. 196407-072)**

Response To: Comment 196407-072

The numbers of cabins and campsites located at particular location can change and development will probably never occur near most of the areas that now have numerous cabins and campsites. Therefore, defining areas now, before

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Another difference between the 1998 NE NPR-A ROD and Alternatives B and C is that only the 1998 ROD prohibits permanent oil and gas facilities within one mile of long term cabins and campsites, except that pipelines and roads would be permitted within 1/4 of a mile of such sites.120 There is nothing like this protection in Alternatives B and C despite the fact that these sites are recognized as "a vehicle for transmitting traditional and family history and knowledge to younger generations". The level of protection is just not the same. **(Comment No. 197616-121)**

Response To: Comment 197616-121

Most cabins and campsites are located along the coast, rivers or lakes. Under the Proposed Action permanent facilities are prohibited within ¾ mile of the coast (stipulation K-6), within ½ to 3 miles of major rivers (stipulation K-1), within ¼ mile of Teshekpuk Lake (stipulation K-3) and other deep water lakes (stipulation K-2), and within ½ mile or more of goose molting lakes (stipulation K-4). Along with the consultation requirements contained in Required Operating Procedure H-1 and H-2 we the level of protection provided to cabin and campsites is comparable. In addition the BLM has developed a MOU with the North Slope Borough regarding cabins and campsites in the National Petroleum Reserve-Alaska (see Appendix L in the FEIS).

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

NE NPR-A ROD Stipulation 47. Special consultation requirements also kick in for any activities within 2 miles of a long term cabin or campsite. NE NPR-A ROD stipulation 23. There is not an equivalent in Alternatives B or C. **(Comment No. 197616-122)**

Response To: Comment 197616-122

Correct, there is a stipulation in Alternative A (47) that does not have an equivalent mitigation in Alternatives B or C. However, the BLM does recognize the importance of subsistence cabins and campsites in the National Petroleum Reserve-Alaska (National Petroleum Reserve-Alaska) and to that end, we have developed a Memorandum of Understanding (MOU) to provide for the long-term protection and management of traditional and historical subsistence cabins and campsites (cabins) located on public lands within the National Petroleum Reserve-Alaska. regarding the use of such campsites and that MOU is available for review in the Final IAP/EIS in Appendix ?.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Cabins and Camp Sites. EPA is concerned that the stipulations and ROPs do not establish adequate protection for traditional use cabins an camp sites in the Planning Area. Many of these cabins and camp sites are used as safety shelters during subsistence hunting and long-distance overland travel throughout the year and are also recognized as important cultural sites. EPA recommends that the BLM consult with local residents and regulatory agencies with subsistence and cultural resource management responsibilities to ensure that the stipulations and ROPs provide adequate spatial and temporal protections for these sites. The consultation efforts and outcomes should be documented in the Final EIS. ***(Comment No.* 197632-012)**

Response To: Comment 197632-012

Please see response to 197616-121 under Cabins and Camps and 196407-072 under Stipulations and ROPs.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Facility Design and Construction. This section addresses potential impacts to subsistence use areas, which would include traditional cabins and camp sites. EPA is concerned that specific set-backs that are currently required have been removed in the proposed stipulations and ROPs. Adequate protection for these sites is a serious concern to local residents. EPA recommends that measurable criteria for protection of these areas, developed in consultation with local residents and Tribal representatives, be added to stipulations and ROPs. ***(Comment No.* 197632-020)**

Response To: Comment 197632-020

See response to comment 197616-121 under topic Cabins and Camp and 196407-072 under topic Stipulations and ROPs.

Comment From: Charles Brower (Comment Letter No. 197980)

The use and enjoyment of all long-term cabins and campsites must be protected. The EIS must analyze how any change in management is likely to affect cabin and campsite users. Buffer zones prohibiting surface facilities around all established cabins and campsites must be maintained. Whether or not structures exist on these sites, they must be recognized as subsistence use sites critical to the nutritional and cultural well being of our residents. The issue must be clearly highlighted in the document. ***(Comment No.* 197980-025)**

Response To: Comment 197980-025

See response to comment 197616-121 under Cabins and Camps

TOPIC: CARIBOU

Comment From: Sean O'Connor (Comment Letter No. 144940)

Furthermore, the 45,000-member Teshekpuk Lake Caribou herd would lose 75 percent of its current protection if the BLM adopts the preferred alternative. These animals constitute an indispensable cultural resource to the Inupiat Eskimo people, and a treasured asset to all Americans. The Teshekpuk Lake area calving grounds would be negatively impacted by adoption of the preferred alternative. ***(Comment No. 144940-003)***

Response To: Comment 144940-003

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: The Wildlife Society (Comment Letter No. 191279)

Under the BLM Preferred Alternative (Alternative B), 88% of the Teshekpuk Lake Caribou Herd's concentrated calving area would be made available for oil and gas leasing. It is not possible to reduce or mitigate disturbance of caribou during calving and no evidence suggests this caribou herd can simply move to another calving area. The Preferred Alternative will also reduce protections for caribou insect relief habitat. The resulting change in land protection status will significantly reduce calving success, productivity, and the population of animals available for subsistence. ***(Comment No. 191279-005)***

Response To: Comment 191279-005

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Calving Grounds, "The calving grounds of the TLH are primarily in the northern portion of the Planning Area near Teshekpuk Lake. If snowmelt occurs in late spring, more caribou will calve south of the lake than if snowmelt occurs in early spring. Kelleyhouse (2001) reported that the size of the TLH annual calving grounds ranged between 938 mi2 and 1,861 mi2.. Recent calving by the TLH has been concentrated southeast and northeast of Teshekpuk Lake (Prichard and Murphy 2004). Carroll (2001) reported that in 2000 calving occurred all around Teshekpuk Lake and that more calves than usual were seen south and west of the lake. Aerial transect data (1999–2001) agree with telemetry data (1990-2004) that during the calving period, caribou use the entire area around Teshekpuk Lake (Carroll, Pers. Comm.).

The importance of this area to calving caribou is emphasized by observed calving success in abnormal years. The return of pregnant cow caribou to the Teshekpuk Lake area can be delayed in years when the caribou migrate further away during winter, or when snow-pack is deeper than normal and/or spring melt-off is later than normal. When their return to the Teshekpuk Lake area is delayed, more cows than usual drop their calves along the way and this in turn results in lower calving success. During 1996-97 most of the herd migrated much farther south than usual and many

Comment From: The Wildlife Society (Comment Letter No. 191279)

The IAP/EIS grossly understates the potential impact of the BLM Preferred Alternative (Alternative B) on the TLH. The IAP/EIS implies that there will be only incremental increases in disturbance, primarily affecting individual animals: "...it is likely that few or no populations would be measurably affected" (IAP/EIS Executive Summary:4). Given that 88% of the TLH concentrated calving area would be made available for leasing and development, this statement is unjustified. Although the IAP/EIS suggests that potential impacts to calving caribou will be minimized as the result of Performance-based Lease Stipulations, currently there is no known way to reduce disturbance of caribou during calving, other than a complete cessation of all development activity in the calving area during the calving period. The only study that has attempted to assess the effectiveness of limiting traffic found there was no reduction in disturbance as a result of traffic restrictions (Lawhead et al. 2004). Furthermore, there is no reason to believe that the TLH can simply move to another calving area, as did the Central Arctic Herd (CAH) because no other similar habitat is available to the TLH. It is reasonable to assume that any development activity within the calving ground

will result in a significant reduction of calving success by the herd. Development-related effects on the portion of the CAH occurring within the oil fields were observed during 1980-2000, despite masking effects of relatively low caribou densities and highly favorable weather on the calving grounds (Wolfe 2000, Cameron et al. 2002, Griffith et al. 2002). Effects included shifting of concentrated calving from the Kuparuk oil field to the southwest of the field and delayed and deflected movement to and from coastal insect-relief areas (Whitten and Cameron 1983; Dau and Cameron 1986; Cameron et al. 1992; Nelleman and Cameron 1996, 1998; Murphy and Lawhead 2000; Wolfe 2000). ***(Comment No.* 191279-024)**

Response To: Comment 191279-024

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Calving Grounds, "The calving grounds of the TLH are primarily in the northern portion of the Planning Area near Teshekpuk Lake. If snowmelt occurs in late spring, more caribou will calve south of the lake than if snowmelt occurs in early spring. Kelleyhouse (2001) reported that the size of the TLH annual calving grounds ranged between 938 mi2 and 1,861 mi2.. Recent calving by the TLH has been concentrated southeast and northeast of Teshekpuk Lake (Prichard and Murphy 2004). Carroll (2001) reported that in 2000 calving occurred all around Teshekpuk Lake and that more calves than usual were seen south and west of the lake. Aerial transect data (1999–2001) agree with telemetry data (1990-2004) that during the calving period, caribou use the entire area around Teshekpuk Lake (Carroll, Pers. Comm.).

The importance of this area to calving caribou is emphasized by observed calving success in abnormal years. The return of pregnant cow caribou to the Teshekpuk Lake area can be delayed in years when the caribou migrate further away during winter, or when snow-pack is deeper than normal and/or spring melt-off is later than normal. When their return to the Teshekpuk Lake area is delayed, more cows than usual drop their calves along the way and this in turn results in lower calving success. During 1996-97 most of the herd migrated much farther south than usual and many cows arrived late to the Teshekpuk Lake area. Only 8 of 21 collared caribou were found in the lake area during calving time and 6 of these calved successfully. Of the other 13 collared cows, only one calved successfully for an overall successful calving percentage of 33 percent. In 2001, heavy snow and a late snow melt-off slowed the migration and only 16 (44 percent) of 36 collared cows calved successfully. Calving success for collared cows that did make it back to the Teshekpuk Lake area in 2001 was much better (88 percent) than ones found outside the area (10 percent)."

If the TLH is displaced from its calving area, as the CAH has been, or if caribou are impeded from reaching the calving area, recent surveys indicate that calving success will most likely be reduced. While there have been no experiments conducted with the TLH to determine whether oil development in the calving area would displace caribou or affect the productivity of the herd, caribou behavior during 1997 and 2001 suggest oil development in the TCH calving area could impact caribou.

Comment From: The Wildlife Society (Comment Letter No. 191279)

Alternatives B and C would allow oil and gas leasing and development in the narrow corridor of land east of Teshekpuk Lake. Most parturient TLH cows must migrate through this corridor shortly before or after calving to gain access to insect relief areas north of Teshekpuk Lake (Prichard et al. 2001). Because cows in the late stage of pregnancy or with newborn calves are most sensitive to disturbance, and dry land used for migration corridors is limited within this corridor, development in this portion of the calving area would adversely affect migration and calf survival.

Displacement from calving grounds can result in overcrowding and competition on suboptimal habitat. Decreased forage availability and lower nutrient intake can reduce reproductive rates (Cameron 1995, Nelleman and Cameron 1998). Caribou cows within oil fields gained less weight and exhibited lower calving and calf survival rates than cows outside oil fields (Cameron 1995). Displacement from prime calving grounds may also increase predation (Whitten et al. 1992, Nelleman and Cameron 1998, Griffith et al. 2002, Young et al. 2002). ***(Comment No.* 191279-031)**

Response To: Comment 191279-031

The final Preferred Alternative provides protection for caribou that use the narrow passage way between Teshekpuk

Lake and the Kogru River by restricting permanent oil and gas activities on approximately 16,500 acres in that area. Please see Lease Stipulation K-9 – Caribou Movement Corridor in the Alternative D (the final preferred alternative).

Comment From: The Wildlife Society (Comment Letter No. 191279)

In summary, the BLM Preferred Alternative (Alternative B) results in an unacceptable risk to the TLH. The alternative will likely displace the TLH from calving grounds and interrupt their movements during the critical insect season. Significant displacement and disturbance during calving and insect seasons will likely result in declining herd productivity and a declining population. A substantial decline in the TLH will have a negative effect to North Slope subsistence hunters. ***(Comment No.* 191279-033)**

Response To: Comment 191279-033

Please see the complete description of the final Preferred Alternative and associated project-specific stipulations protecting caribou. Lease Stipulations K-4 – Goose Molting Area, K-5 – Teshekpuk Lake Caribou Habitat Area, K-6 – Coastal Area, K-8 – Pik Dunes, K-9 – Caribou Movement Corridor, K-10 – Southern Caribou Calving Area, and K-11 – Lease Tracts A-G.

Comment From: Brenda Wright (Comment Letter No. 195732)

Juneau Audubon supports environmentally safe natural resource exploration and extraction. We do not support decreasing the protected area of critical habitat around Teshekpuk Lake. Along with important goose-molting habitat, the Teshekpuk Lake Surface Protection Area provides the most concentrated caribou calving and insect relief areas.

Response To: Comment 195732-002

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Mark Udall, Congress of the United States (Comment Letter No. 197613)

BLM has not provided any new scientific data to support or justify reducing the protections for these important caribou habitats. BLM's preferred alternative places the Teshekpuk Lake herd at risk of being displaced from their calving grounds and by disrupting their movements during the critical insect season. As a result, significant displacement and disturbance during calving and insect seasons would likely result in declining herd productivity, resulting in population-level impacts to the herd. ***(Comment No.* 197613-006)**

Response To: Comment 197613-006

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM provided no new scientific data, however, to support or justify reducing the TLSPA protections for these important caribou habitats. BLM's preferred alternative places the TLH at risk of being displaced from their calving grounds and by disrupting their movements during the critical insect season. Significant displacement and disturbance during calving and insects seasons would likely result in declining herd productivity resulting in population-level impacts to the TLH. A substantial decline in the TLH would reduce subsistence hunting opportunities for Native subsistence users on the North Slope. ***(Comment No.* 197617-076)**

Response To: Comment 197617-076

The Final IAP/EIS has been revised in consideration of your comments. The following text was added to Section 4.6.9.1 Terrestrial Mammals, Oil and Gas Development Activities, Effects of Disturbance, Caribou, "Some TLH caribou movements during the insect-relief season (late June-August 15) would likely be affected by pipelines and road traffic. The critical part of the movement to the coastal insect-relief area is through the narrow corridor between Teshekpuk Lake and the Kogru River. Caribou must pass through these corridors to get to and from insect-relief areas. The area to the east of Teshekpuk Lake is a particular problem because nearly all of the parturient cows pass through this area either shortly before or after calving (Carroll Pers. Comm.). Any development that occurs on the limited amount of habitat that is used by caribou migrating through this corridor would likely affect caribou movements. Stipulation K-9 designates an NSO area extending from the eastern shore of Teshekpuk Lake approximately 4 miles eastward towards the Kogru Inlet (approximately 116,000 acres). The NSO designation prohibits permanent oil and gas facilities including major rights-of-way such as pipelines and roads. This stipulation should protect enough land to allow caribou use of this major migration corridor. However, pipelines could be allowed in the NSO area north of Teshekpuk Lake and south/southeast of the lake. Careful siting of pipeline and road rights-of-way would still be required to prevent affects on caribou use of this corridor. Additionally, the areas that would be excluded from surface occupancy do not extend to the coast suggesting that there could be some development along the coastline. While a set-back from the coast is stipulated (Lease Stipulation K-6), development in the coastal area would likely impact caribou use of insect-relief areas near the coast, though the number of developments would be restricted by stipulation K-11."

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS at 4-214 again acknowledges that the Preferred Alternative would have greater impacts on caribou than the No Action Alternative. However, there is no clear quantification of those impacts. Later, it is inferred that the 213,000 acre no-lease area and caribou stipulations would protect caribou at Teshekpuk Lake. These assurances, however, are based on few data and there is little analysis to demonstrate that these are adequate conservation safeguards for this important caribou herd. The clear lack of analysis and quantification of degree of impacts between different alternatives is a serious flaw in this draft Amended IAP/EIS. Although the draft Amended IAP/EIS acknowledges that the Preferred Alternative has greater impacts than the No Action Alternative, it is difficult if not impossible to evaluate how much more impact there is. We simply cannot accept on good faith that the additional impact will be minimal and yet that it was the draft IAP/EIS asks us to do. **(Comment No. 197617-080)**

Response To: Comment 197617-080

See response to comment 197617-076 under Caribou

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Page 6, Summary of Impacts: The second paragraph states that calving by TLH caribou could be reduced near pipeline corridors, but that Stipulations developed for the draft Preferred Alternative and Alternative C would provide protection for insect-relief habitat in the Planning area. This statement implies that these Alternatives offer protection either equal to or greater than the No Action Alternative. This assessment does not acknowledge that under both the draft Preferred Alternative and Alternative C, there is a greater likelihood of impact to caribou because critical calving, migration, and insect-relief areas currently protected by no-lease and no-surface-occupancy areas would become available for oil leasing and development. **(Comment No. 197618-012)**

Response To: Comment 197618-012

See response to comment 197617-076 under Caribou

Comment From: State of Alaska (Comment Letter No. 197620)

Inconsistent Displacement Distances In more than one location in this document, varying distances are used to describe displacement or effects of disturbance to individual animals. For example, distances of anywhere from 1 to 2.5 miles are given as the displacement of calving caribou from roads. The correct distances need to be consistently used throughout the document to accurately present the potential impacts of various aspects of the proposed alternatives. ***(Comment No. 197620-043)***

Response To: Comment 197620-043

Displacement distances vary greatly depending upon the individual, the amount and type of traffic and whether avoidance is specifically roads or includes other infrastructure and the various activities associated with it. We have reviewed these distances for consistency based upon your comment.

Comment From: State of Alaska (Comment Letter No. 197620)

Caribou must pass through these corridors to get to and from insect relief areas. Any development that occurs on the limited amount of habitat that is used by caribou migrating through this corridor would likely affect caribou movements. The area to the east of Teshekpuk Lake is a particular concern because nearly all of the parturient cows pass through this area either shortly before or after calving. Cows with calves are very sensitive to disturbance and would be strongly affected by development in this area. Disturbance would affect movements and add stress for both the cows and calves during this critical time of the year. The calves are young and vulnerable. The cows are highly stressed from surviving the winter and from lactation. ***(Comment No. 197620-091)***

Response To: Comment 197620-091

The Final IAP/EIS has been revised in consideration of your comments. In the conclusion section of this section we added the following: Studies done over the last decade have indicated that TLH caribou show high fidelity to the calving area near Teshekpuk Lake and that caribou that calve in the traditional calving area have much higher calving success than caribou found outside the area. Collared caribou that are found within the currently protected areas (as identified in 1998 ROD) during calving season have much higher calving success than caribou found outside the areas. In surveys conducted since 1990, 147 out of 163 (90 percent) TLH caribou that calved successfully calved within these protected areas. Of the 178 caribou that were found within the protected areas, 83 percent calved successfully. Of the 59 cows that were found outside the protected areas during calving season, 25 percent calved successfully (Carroll 2003).

If the TLH is displaced from its calving area, as the CAH has been, or if caribou are impeded from reaching the calving area, recent surveys indicate that calving success will most likely be reduced. While there have been no experiments conducted with the TLH to determine whether oil development in the calving area would displace caribou or affect the productivity of the herd, caribou behavior during 1997 and 2001 suggest oil development in the TCH calving area could impact caribou. During 1996-97, most of the herd migrated much farther south than usual and many cows arrived late to the calving area. Only 8 of 21 collared caribou were found in the calving area during calving

Comment From: Mark Ahmakak (Comment Letter No. 197973)

For the record, in my involvement with the studies on fisheries and caribou, the water fowl, some of these studies have been documented, but however, they are fully reported to the proper agencies in taking the subject of the caribou herds. A herd of a 1,000 or 1,500 two summers ago they were migrating through melt (ph) water, which they normally don't and they went right on up to Kuparuk area and they had no way of crossing the pipeline. We were just monitoring them from hour to hour and they just veered off directly to the east towards Sagwon to the Canning River. ***(Comment No. 197973-099)***

Response To: Comment 197973-099

Thanks for the interesting comment. The potential for caribou to be deflected from migration pathways by pipelines is an important consideration discussed in the EIS.

Comment From: John Schoen (Comment Letter No. 197975)

Industrial infrastructure in this ecologically sensitive area and geographically restricted region significantly risk displacing caribou and geese to less productive habitats and would likely cause population declines. ***(Comment No. 197975-093)***

Response To: Comment 197975-093

BLM has design various stipulations and ROPs to mitigate impacts to ecologically sensitive areas. Displacement to less productive habitats is of concern and is addressed in the EIS.

Comment From: Brodie Anderson (Comment Letter No. 197976)

The Northern Center understands the necessary development that is planned for the northeast, but the Northern Center is concerned with the extent of the impact on the environment that the Draft EIS proposes through the preferred alternative and Alternative C. Instead, the Northern Center would like to recommend Alternative A as the plan that both meets the resource development and habitat protection needs. Alternative A permits approximately four million acres, or 87 percent of the land available for leasing. That is approximately 600 million barrels of recoverable oil while preserving the critical habitat to the variety of animals and birds. A few examples of these critical areas that need protecting beyond what is offered in the preferred alternative or Alternative C is, already stated, Teshekpuk Lake and the Colville River. Teshekpuk Lake area has the most concentrated calving activity for the 45,000-animal Teshekpuk Lake Caribou Herd. This activity occurs south, east, and northeast of the lake. After calving, much of the caribou herd moves to coastal habitats east, north and northwest of Teshekpuk Lake seeking relief from the swarms of biting insects, already stated. The Teshekpuk Lake Herd is growing and is the most important herd for subsistence harvesting for Alaska Natives living on the North Slope. It may not be possible to sustain the current levels of subsistence harvests if industrial-scale oil development encroaches on the levels of calving and insect-relief habitats. The major -- the increased development activity of industrial oil development could have major consequences on the Teshekpuk Lake Caribou affecting not only the herd, but the subsistence way of life. **(Comment No. 197976-053)**

Response To: Comment 197976-053

Your comment and others like it have prompted BLM to consider additional alternatives that provide additional protection to caribou in the area.

Comment From: Rosemary Ahtuangaruak (Comment Letter No. 197976)

We have seen increase to health problems with increase in asthma. When I started as a health aide in 1986, I had one person with asthma. When I left that position in 2000, we were seeing close to 100 people with breathing difficulties. Without being able to provide for our health and well-being, we're not going to be able to continue our traditional activities. To subsist, it's a lot of work. We work very hard to fill our ice cellar and provide for our families. Our subsistence resources only come to us in the summer and we have the Teshekpuk Herd, which was a stationary herd, but last year they took off for the first time in the years that they have been monitoring. They moved all the way over to Barter Island and into ANWR. Those caribou, many of them died this year. There was a large caribou die-off throughout the whole North Slope. Those caribou did not make it past the Dalton Highway to calve. We don't know where those calves are going to consider their home territory. We're very concerned when this stationary herd is not in its stationary lands with one season of seismic activity. ***(Comment No. 197976-142)***

Response To: Comment 197976-142

The TLH have been know to move great distances but have maintained their presence in the Teshekpuk lake area. Seismic exploration has occurred in the NPRA for a number of years not just last year.

TOPIC: CARIBOU

ISSUE: CALVING

Comment From: Kristi Espinoza (Comment Letter No. 118849)

I'm sure you've heard of the 45,000-animal Teshekpuk Lake Caribou Herd that attracts public interest, educational interest, and tourist dollars. This herd, which migrates annually to the lands around Teshekpuk Lake to have their babies and seek refuge from disease-spreading insects, will be severely threatened by the development proposed in the current proposal. How? Well, if caribou are forced to move to less desirable habitats, calving numbers could decline, which would reduce the population; ***(Comment No. 118849-005)***

Response To: Comment 118849-005

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Sharon Wyberg (Comment Letter No. 186677)

Opening all the lands contemplated by the Administration is simply too great of a risk to the bird and wildlife species that summer there. Spills will occur. Even worse, the simple presence of development will impact the caribou herds that calve in the region. , the consequences too likely to be irreversible. ***(Comment No. 186677-005)***

Response To: Comment 186677-005

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Charles Barnwell (Comment Letter No. 193638)

North Slope oil and gas development could result in a long-term displacement and/or functional loss of habitat for the Central Arctic Herd (CAH), Teshekpuk Lake Herd (TLH), and Western Arctic Herd (WAH) of caribou. Oil development in the Prudhoe Bay-Kuparuk area could be a cause of an observed shift in central arctic caribou calving distribution away from its calving range near the oil fields. Calving by TLH caribou could be reduced near the pipeline corridors, which would have a potential long-term (several-generation) effect on the distribution of the TLH caribou. ***(Comment No. 193638-002)***

Response To: Comment 193638-002

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Central Sierra Environmental Resource Center (Comment Letter No. 196940)

In particular, the no-lease area of 213,00 acres proposed to protect goose molting habitat is inadequate to protect the biological integrity of the Teshekpuk Lake caribou herd. Past experiences in the Prudhoe Bay and Kuparuk oilfields indicate that pregnant cows and cows with newborn calves avoid infrastructure. Since Teshekpuk Lake is currently used as a corridor between the herd's main foraging area and the insect relief area of the Beaufort Sea coast, development activities would likely displace caribou from their traditionally preferred habitat and decrease

herd health and abundance. ***(Comment No. 196940-002)***

Response To: Comment 196940-002

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Ann Dyes (Comment Letter No. 196944)

The size of the caribou herds would likely decline also. During calving in June and July the herds wind around the many lakes along the coast while foraging for food. Roads through the area would limit where the herds travel and likely reduce the size of the herds due to a reduction in areas available for grazing. Alaska natives from the North Slope are subsistence users of the caribou. The survival of the caribou is vital to their existence. ***(Comment No. 196944-003)***

Response To: Comment 196944-003

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The Preferred Alternative in the DEIS reduces the size of the TLSPA by 75 percent. Only 213,000 acres north and northeast of Teshekpuk Lake would be closed to leasing, thus opening most of the concentrated calving area to oil development. Important caribou insect-relief habitat also would be opened to oil development. Under Alternative A (status quo for the TLSPA), 74 percent of the concentrated calving area (as defined by the Univ. of Alaska Fairbanks, 2001) was protected (Fig. 1). In contrast. under the Preferred Alternative, only 12 percent of this sensitive area is protected (Fig. 2). Thus, 88 percent of the concentrated calving area would be at risk. The TLSPA now protects 84 percent of the insect-relief habitat as defined in 2003 by the Alaska Department of Fish and Game, North Slope Borough, and ABR Inc. (Fig. 3). Under the Preferred Alternative, only 41 percent of insect-relief habitat would be protected from oil development (Fig. 4). ***(Comment No. 197610-021)***

Response To: Comment 197610-021

See response to comment 197617-076 under Caribou

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Concerns about caribou also have been raised by the National Research Council (2003) in its review and analysis of the cumulative effects of oil and gas activities on Alaska's North Slope: If the calving ground of the TLH [Teshekpuk Lake Herd] continues to be protected, direct conflicts with parturient females of that herd are unlikely, provided that their movements are not impeded. However if inland lease tracts in the northeastern portion of the National Petroleum Reserve-Alaska are developed, effects on midsummer distribution, habitat use, and productivity of the TLH caribou are possible. ***(Comment No. 197610-023)***

See response to comment 197617-076 under Caribou

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Notwithstanding oil development's negative effects on caribou in the Central Arctic, favorable environmental conditions, a low density of animals on the calving and post-calving grounds, and available calving area outside the oil fields on the broad coastal plain may have minimized the population-level impacts at this time. Griffith et al. (2002) predicted significant population-level impacts to the Porcupine Caribou Herd from industrial development of the concentrated calving ground. This also may be a problem for caribou at Teshekpuk Lake if development occurs within their concentrated calving area or oil field infrastructure affects seasonal movements of the herd, particularly

during insect season. ***(Comment No. 197610-038)***

Response To: Comment 197610-038

The Final IAP/EIS has been revised in consideration of your comments. The following text was added to Section 4.6.9.1 Terrestrial Mammals, Oil and Gas Development Activities, Effects of Disturbance, Caribou, "Some TLH caribou movements during the insect-relief season (late June-August 15) would likely be affected by pipelines and road traffic. The critical part of the movement to the coastal insect-relief area is through the narrow corridor between Teshekpuk Lake and the Kogru River. Caribou must pass through these corridors to get to and from insect-relief areas. The area to the east of Teshekpuk Lake is a particular problem because nearly all of the parturient cows pass through this area either shortly before or after calving (Carroll Pers. Comm.). Any development that occurs on the limited amount of habitat that is used by caribou migrating through this corridor would likely affect caribou movements. Stipulation K-9 designates an NSO area extending from the eastern shore of Teshekpuk Lake approximately 4 miles eastward towards the Kogru Inlet (approximately 116,000 acres). The NSO designation prohibits permanent oil and gas facilities including major rights-of-way such as pipelines and roads. This stipulation should protect enough land to allow caribou use of this major migration corridor. However, pipelines could be allowed in the NSO area north of Teshekpuk Lake and south/southeast of the lake. Careful siting of pipeline and road rights-of-way would still be required to prevent affects on caribou use of this corridor. Additionally, the areas that would be excluded from surface occupancy do not extend to the coast suggesting that there could be some development along the coastline. While a set-back from the coast is stipulated (Lease Stipulation K-6), development in the coastal area would likely impact caribou use of insect-relief areas near the coast, though the number of developments would be restricted by stipulation K-11."

The following information was also added in subsequent paragraphs, " The National Research Council (2003) suggested that the combined effects of industrial activity and infrastructure, and the stress imposed by insects, might have contributed to the reduction in size of the herd seen from 1992 through 1995. Cronin et al. (2000) argued that population-level impacts from oil field development have not occurred for this herd. However, comparing the higher growth rate of the TLH to the growth rate of the CAH, Griffith et al. (2002) suggested that the CAH might have been influenced by development infrastructure after 1987."

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Displacement from calving grounds can result in overcrowding and competition on suboptimal habitat. Decreased forage availability and lower nutrient intake can reduce reproductive rates (Cameron 1995, Nelleman and Cameron 1998). Caribou cows within oil fields gained less weight and exhibited lower calving and calf survival rates than did cows outside oil fields (Cameron 1995). Displacement from prime calving grounds may also increase predation (Whitten et al. 1992, Nelleman and Cameron 1998, Griffith et al. 2002, Young et al. 2002). ***(Comment No. 197610-042)***

Response To: Comment 197610-042

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Among the four Arctic Alaska caribou herds, the Teshekpuk Lake Herd appears to receive a disproportionately high percentage of the North Slope subsistence harvest (C. George, pers. communication 2002), which took 9 percent of the herd during the period 1999-2000 (Carroll 2002). Because as much as 8-9 percent of the herd is harvested annually, Carroll suggested that any negative effect on population recruitment could have a strong impact on local hunters. Carroll also reported that caribou at Teshekpuk lake demonstrate strong fidelity to a small calving area around the lake and that calves born in this area have a higher survival rate than those born during migration. ***(Comment No. 197610-044)***

Response To: Comment 197610-044

This comment refers to personal communications not reviewed by the authors. We need biological response before making any subsistence response. Does the Teshekpuk Lake Herd receive a disproportionately high percentage of NS subsistence harvest? Does the subsistence harvest take nine percent of the herd annually? Will there be a negative effect on population recruitment? If the biologists can provide those answers, we can make corresponding subsistence response to comments.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Oil and gas developments in northeastern NPR-A have the potential to significantly impact the Teshekpuk Lake Herd. A geographical information system (GIS) analysis showed that 100 percent of the herd's calving area overlaps with high oil potential (Audubon Alaska 2002). Measures to mitigate oil development impacts that appeared to work during exploration and onset of development in the Central Arctic may have become less effective as the cumulative effects of expanding development increased and the oil fields became operational (K. Whitten, pers. communication 2002). ***(Comment No. 197610-046)***

Response To: Comment 197610-046

The Final IAP/EIS has been revised in consideration of your comments. We have provided additional information in the cumulative impacts section of the document indicating that cumulative oil and gas development on the North Slope could result in a long-term displacement and/or functional loss of habitat for CAH, TLH, and WAH caribou over the productive life of the leases. At present, cumulative oil development in the Prudhoe Bay-Kuparuk area has caused displacement of CAH caribou from a portion of the calving range, with a shift in calving distribution away from the oil fields (Nellemann and Cameron 1996; Lawhead 1997; Cameron et al. 2002; NRC 2003). Additionally, we have made the distinctions between the impacts of the four alternatives more clear specifically Alternatives A and D protects key caribou calving areas with No Surface Occupancy Restrictions.

Comment From: Mark Udall, Congress of the United States (Comment Letter No. 197613)

It is important to maintain high productivity in the Teshekpuk Lake herd because it is a very important subsistence resource and is harvested at a higher rate than other arctic caribou herds. A high level of harvest can be maintained only if productivity remains high. The National Research Council (2003) concluded that productivity was reduced in the segment of the Central herd exposed to oil development because of displacement from their calving area and hindrance to moving to and from insect relief areas. ***(Comment No. 197613-007)***

Response To: Comment 197613-007

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The Amended Draft EIS completely misses the boat when it comes to impacts to the TLH from opening up more of the area around Teshekpuk Lake to surface occupancy (i.e. by leasing more acreage and by eliminating the 5 to 6 mile No-Surface occupancy buffer zone). It does this by jumping to the conclusion that the TLH will adjust to industrialization in the same way that the CAH has.133 This jump in reasoning is fatally flawed since there is no consideration of the TLH's specific circumstances or the geographic and topographical area involved. For one, the TLH animals have proven to calve less successfully outside the area around Teshekpuk Lake that is closed to leasing and surface occupancy. According to the summer of 1997 Alaska Department of Fish and Game Caribou Survey-Inventory the calving success rate for animals that calved outside the TLH's traditional calving grounds was poor - only 8%. In the same year, calving success for the animals that did calve in the traditional calving grounds was 75%.134 This was not a one year occurrence. As the 2003 ADFG Caribou Survey-Inventory noted, 90% of the TLH animals that calved in the area around Teshekpuk lake since 1990 did so successfully whereas the overall calving

success rate for TLH caribou calves born outside the Teshekpuk Lake area during this same period drops to 25%.135 ***(Comment No. 197616-140)***

Response To: Comment 197616-140

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Calving Grounds, "The calving grounds of the TLH are primarily in the northern portion of the Planning Area near Teshekpuk Lake. If snowmelt occurs in late spring, more caribou will calve south of the lake than if snowmelt occurs in early spring. Kelleyhouse (2001) reported that the size of the TLH annual calving grounds ranged between 938 mi2 and 1,861 mi2.. Recent calving by the TLH has been concentrated southeast and northeast of Teshekpuk Lake (Prichard and Murphy 2004). Carroll (2001) reported that in 2000 calving occurred all around Teshekpuk Lake and that more calves than usual were seen south and west of the lake. Aerial transect data (1999–2001) agree with telemetry data (1990-2004) that during the calving period, caribou use the entire area around Teshekpuk Lake (Carroll, Pers. Comm.).

The importance of this area to calving caribou is emphasized by observed calving success in abnormal years. The return of pregnant cow caribou to the Teshekpuk Lake area can be delayed in years when the caribou migrate further away during winter, or when snow-pack is deeper than normal and/or spring melt-off is later than normal. When their return to the Teshekpuk Lake area is delayed, more cows than usual drop their calves along the way and this in turn results in lower calving success. During 1996-97 most of the herd migrated much farther south than usual and many cows arrived late to the Teshekpuk Lake area. Only 8 of 21 collared caribou were found in the lake area during calving time and 6 of these calved successfully. Of the other 13 collared cows, only one calved successfully for an overall successful calving percentage of 33 percent. In 2001, heavy snow and a late snow melt-off slowed the migration and only 16 (44 percent) of 36 collared cows calved successfully. Calving success for collared cows that did make it back to the Teshekpuk Lake area in 2001 was much better (88 percent) than ones found outside the area (10 percent)."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Both of these ADFG Caribou Inventory-Surveys are listed in the Bibliography for the Amended Draft EIS - but nowhere does the Amended Draft EIS discuss the evidence of a direct correlation between the TLH's calving success and the area around Teshekpuk Lake. The Amended Draft EIS does not analyze or consider the likely impacts on the TLH of deflection of pregnant cows that would be caused by industrial activities in these calving areas. All that the Amended Draft EIS says is that "[c]alving en route to calving grounds could result in reduced calf survival."136 Duh! A statement of the obvious is no substitute for an analysis of the likely impact. This does not even begin to capture the significance of this information that the BLM had at its fingertips regarding calf survival! It is oversights like this that makes us doubt whether the BLM will fulfill its obligations under a performance based plan. ***(Comment No. 197616-141)***

Response To: Comment 197616-141

See response to comment 197616-140 under Caribou - Calving

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Second, the TLH's calving area seems to be much smaller than the CAH's traditional calving area.137 With a smaller core calving area, the TLH may be more sensitive to displacement from facilities than the CAH have exhibited.138 This was not considered in the Amended Draft EIS. A third factor, which is related to the second, is the type of habitat selected by the TLH to calve. ***(Comment No. 197616-142)***

Response To: Comment 197616-142

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 4.4.9.1 Terrestrial Mammals, Conclusions, "Studies done over the last decade have indicated that TLH caribou show high fidelity to the calving area near Teshekpuk Lake and that caribou that calve in the traditional calving area

have much higher calving success than caribou found outside the area. Collared caribou that are found within the currently protected areas (as identified in 1998 ROD) during calving season have much higher calving success than caribou found outside the areas. In surveys conducted since 1990, 147 out of 163 (90 percent) TLH caribou that calved successfully calved within these protected areas. Of the 178 caribou that were found within the protected areas, 83 percent calved successfully. Of the 59 cows that were found outside the protected areas during calving season, 25 percent calved successfully (Carroll 2003).

If the TLH is displaced from its calving area, as the CAH has been, or if caribou are impeded from reaching the calving area, recent surveys indicate that calving success will most likely be reduced. While there have been no experiments conducted with the TLH to determine whether oil development in the calving area would displace caribou or affect the productivity of the herd, caribou behavior during 1997 and 2001 suggest oil development in the TCH calving area could impact caribou. During 1996-97, most of the herd migrated much farther south than usual and many cows arrived late to the calving area. Only 8 of 21 collared caribou were found in the calving area during calving time and 6 of these calved successfully. Of the other 13 collared cows, only one calved successfully for an overall successful calving percentage of 33 percent. In 2001, heavy snow and a late snow melt-off slowed the migration and only 16 (44 percent) of 36 collared cows calved successfully. Calving success for collared cows that did make it back to the calving area in 2001 was much better (88 percent) than cows that did not make it back (10 percent). This suggests that if oil development takes place in such a way that it displaces caribou from the calving area or interferes with their ability to get to the calving area, it could have an effect on productivity and population numbers (Carroll 2003).

Comment From: Environmental Coalition (Comment Letter No. 197617)

Concerns about the TLH have also been raised by the National Research Council (2003) in their review and analysis of the cumulative effects of oil and gas activities on Alaska's North Slope. In that report, the NRC stated, "If the calving ground of the TLH continues to be protected, direct conflicts with parturient females of that herd are unlikely, provided that their movements are not impeded. However if inland lease tracts in the northeastern portion of the National Petroleum Reserve-Alaska are developed, effects on midsummer distribution, habitat use, and productivity of the TLH caribou are possible." ***(Comment No.* 197617-077)**

Response To: Comment 197617-077

See response to comment 197610-042 under Caribou - Calving

Comment From: USFWS Anchorage (Comment Letter No. 197619)

The existing no-lease area, combined with the no-surface-occupancy area, also encompasses critical calving, migration and insect-relief habitats for the Teshekpuk Lake Caribou Herd (TLH). Recent telemetry data indicate that collared cows found within these areas during calving season have much higher calving success than those found outside the areas. In surveys conducted since 1990, 90 percent (147 out of 163) of collared TLH cows that calved successfully did so within these protected areas (Carroll 2003). During most years, over 75% of the herd uses the area around and north of the lake during the insect season. The TLH continues to be an important subsistence resource, providing most of the caribou harvested by the Native communities of Atqasuk, Barrow, Nuiqsut, and Wainwright. In recent years, 2,500 to 2,800 TLH caribou (about 6 percent of the herd) have been harvested annually (Carroll 2003). ***(Comment No.* 197619-006)**

Response To: Comment 197619-006

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 4.4.9.1 Terrestrial Mammals, Conclusions, "Studies done over the last decade have indicated that TLH caribou show high fidelity to the calving area near Teshekpuk Lake and that caribou that calve in the traditional calving area have much higher calving success than caribou found outside the area. Collared caribou that are found within the currently protected areas (as identified in 1998 ROD) during calving season have much higher calving success than caribou found outside the areas. In surveys conducted since 1990, 147 out of 163 (90 percent) TLH caribou that

calved successfully calved within these protected areas. Of the 178 caribou that were found within the protected areas, 83 percent calved successfully. Of the 59 cows that were found outside the protected areas during calving season, 25 percent calved successfully (Carroll 2003).

If the TLH is displaced from its calving area, as the CAH has been, or if caribou are impeded from reaching the calving area, recent surveys indicate that calving success will most likely be reduced. While there have been no experiments conducted with the TLH to determine whether oil development in the calving area would displace caribou or affect the productivity of the herd, caribou behavior during 1997 and 2001 suggest oil development in the TCH calving area could impact caribou. During 1996-97, most of the herd migrated much farther south than usual and many cows arrived late to the calving area. Only 8 of 21 collared caribou were found in the calving area during calving time and 6 of these calved successfully. Of the other 13 collared cows, only one calved successfully for an overall successful calving percentage of 33 percent. In 2001, heavy snow and a late snow melt-off slowed the migration and only 16 (44 percent) of 36 collared cows calved successfully. Calving success for collared cows that did make it back to the calving area in 2001 was much better (88 percent) than cows that did not make it back (10 percent). This suggests that if oil development takes place in such a way that it displaces caribou from the calving area or interferes with their ability to get to the calving area, it could have an effect on productivity and population numbers (Carroll 2003)."

The following information was also added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Harvest, "Subsistence harvest of the TLH is year-round, with most occurring between July and October by residents of Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Hope, and Wainwright. It is difficult to determine precise numbers for TLH harvest because not all hunters report their harvest and because most villages harvest caribou from more than one herd. However, by examining village subsistence harvest studies and using radiotelemetry data to determine the percentage of caribou that are in village hunt areas during harvest season, a reasonable estimate can be made of TLH harvest. Approximately 2,500 TLH caribou in 1999-2000, and 2,760 during 2000-2001, were harvested by residents of North Slope villages. Harvest of the TLH by sport hunters is generally low and mostly

Comment From: State of Alaska (Comment Letter No. 197620)

Migration. The text states that after calving, most of the caribou spread out from the calving area to the east, west, and south. To the contrary, nearly all of the parturient cows migrate north through the narrow corridor located between Teshekpuk Lake and the Kogru River shortly before or after calving. During this period they are very sensitive to disturbance and would be most affected by development in the area. Most of the herd then uses the area along the coast for insect relief. After the insect relief period, TLH caribou spread out and can be found across the North Slope coastal plain. Fall movements of the TLH are variable among individual caribou and years. **(Comment No. 197620-053)**

Response To: Comment 197620-053

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Migration, " After calving, most TLH caribou move north of Teshekpuk Lake, with most parturient cows traveling through the narrow migration corridor between the lake and the Kogru River. Most of the herd uses the area along the coast for insect relief. After the insect-relief period, TLH caribou spread out and can be found across the North Slope coastal plain, primarily within the National Petroleum Reserve – Alaska. Fall movements of the TLH are variable among individual caribou and years. Most TLH caribou winter on the National Petroleum Reserve – Alaska coastal plain, but occasionally some or most of the herd winters in other places such as Anaktuvuk Pass or northwestern Alaska as far south as the Nulato Hills."

Comment From: State of Alaska (Comment Letter No. 197620)

Calving Grounds. While the size of the TLH annual calving grounds has been reported to range from 938 square miles to 1,861 square miles (Kelleyhouse 2001), recent calving by the TLH has been concentrated southeast and northeast of Teshekpuk Lake. Carroll (2001) reported that in 2000 calving occurred all around Teshekpuk Lake and that more calves than usual were south and west of the lake. Aerial transect data (1999-2001) agree with telemetry data (1990-2004) that during the calving period, caribou use the entire area around Teshekpuk Lake. **(Comment No. 197620-054)**

Response To: Comment 197620-054

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Calving Grounds, " The calving grounds of the TLH are primarily in the northern portion of the Planning Area near Teshekpuk Lake. If snowmelt occurs in late spring, more caribou will calve south of the lake than if snowmelt occurs in early spring. Kelleyhouse (2001) reported that the size of the TLH annual calving grounds ranged between 938 mi2 and 1,861 mi2.. Recent calving by the TLH has been concentrated southeast and northeast of Teshekpuk Lake (Prichard and Murphy 2004). Carroll (2001) reported that in 2000 calving occurred all around Teshekpuk Lake and that more calves than usual were seen south and west of the lake. Aerial transect data (1999–2001) agree with telemetry data (1990-2004) that during the calving period, caribou use the entire area around Teshekpuk Lake (Carroll, Pers. Comm.)."

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative B, Section 4.4.9, Mammals, Oil and Gas Development. Caribou. Page 4-21 3. The text states that exposure from helicopter traffic, seismic operations, exploration drilling, and pipeline construction is not expected to have any effects at the population level. However, the combination of these temporary activities with development activities, which could include a network of drill pads, pipelines, roads, bridges, power lines, and the activity required to build and maintain this infrastructure, may have an effect on the TLH at the population level. Studies done over the last decade indicate that TLH caribou are sensitive to displacement from their calving area. If the TLH is displaced from its calving area or if caribou are impeded from reaching the calving area, recent surveys indicate that calving success will most likely be reduced with a resulting drop in the TLH population. Therefore, it must be acknowledged that even temporary activities must be managed to avoid displacing or impeding the TLH from its calving area. ***(Comment No.* 197620-092)**

Response To: Comment 197620-092

The Final IAP/EIS has been revised in consideration of your comments. See responses to comment 197620-090 under Caribou - Movement and 197620-091 under Caribou.

Comment From: Mary Ann McCall (Comment Letter No. 197639)

Calving caribou are also easily disturbed, and needless expenditures of energy reduce feeding time and reproductive success. Thus area is remote, relatively free of predators, and has high quality forage for geese and caribou. ***(Comment No.* 197639-004)**

Response To: Comment 197639-004

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Geoff Carroll (Comment Letter No. 197980)

Second, it is very important for pregnant cows to get to and use the calving area, which is south, east, and north of Teshekpuk Lake. Over ninety percent of pregnant cows calve in this traditional calving area. During years when cows can't get back to the calving area, calving success has been much lower than years when most of the cows did get back. Third, there is a narrow corridor of land between the east side of Teshekpuk Lake and the Kogru River, which nearly all of the parturient cows must travel through shortly before or after calving to get to insect relief areas. Cows with calves are very sensitive to disturbance, so we have the most important segment of the population passing through this corridor during the time of year when they are having calves and are most sensitive to disturbance. Development in this corridor and the calving area south of there could have a detrimental effect on the herd. ***(Comment No.* 197980-039)**

Response To: Comment 197980-039

Under the Final Preferred Alternative over 350,000 acres north, east, and south of Teshekpuk Lake have a no surface occupancy restriction on permanent oil and gas activities; only exploration during the winter season would be allowed in these areas. See specifically lease stipulations K-4, K-9, K-10, and K-11.

Comment From: Geoff Carroll (Comment Letter No. 197980)

I found the section on caribou in the Affected Environment Section in the EIS to be incomplete, lacking in the most recent information and inaccurate in some cases. One of the inaccuracies is the statement on page 349, where it states; "After calving most of the caribou spread out from the calving areas to the east, west and south." This is completely false and is very significant to the decisions that are being made through this process. The fact is that, as I previously mentioned, nearly all of the parturient cows move north through the narrow corridor between Teshekpuk Lake and the Kogru River. It would be very difficult to have any development in this corridor without the risk of seriously affecting the population. However, this corridor is part of the area that BLM has proposed to open to leasing and development. I would like to ask that before final decisions are made, you obtain accurate and up to date information and take it into account before key decisions, like opening this corridor to development are made. ***(Comment No.* 197980-045)**

Response To: Comment 197980-045

The referenced sentences have been removed from the Final IAP/EIS, and the text has been revised to reflect more current data.

Comment From: Geoff Carroll (Comment Letter No. 197988)

It's very important for pregnant cows to get to and use the calving area, which is south, east and north of Teshekpuk Lake. Over 90% of pregnant cows calve in this traditional calving area. During years when cows can't get back to the calving area, calving success has been much lower than years when most of the cows did get back. ***(Comment No.* 197988-214)**

Response To: Comment 197988-214

Lease stipulations K-9 and K-10 were developed for the Final Preferred Alternative D in response to this and similar comments. Several other lease stipulations and ROPs (E-7 and K-5) also address these issues.

Comment From: Geoff Carroll (Comment Letter No. 197988)

One of the inaccuracies in the statement was on page 3-49, where it states: after calving, most of the caribou spread out from the calving area to the east, west and south. This is completely false and is very significant to the decisions that are being made. The fact is that nearly all of the parturient cows move north through the narrow corridor between Teshekpuk Lake and the Kogru River. It would be very difficult to have any development in this corridor without the risk of seriously affecting the population. However, the corridor is part of the area that BLM has proposed to open to leasing and development. I'd like to ask that, you know, before final decisions are made that, you know, you obtain accurate and up-to-date information and take that into account before key decisions like opening the corridor to development are made. ***(Comment No.* 197988-217)**

Response To: Comment 197988-217

Please see lease stipulation K-9 for a description of the corridor.

TOPIC: CARIBOU

ISSUE: DISTRIBUTION

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Map 3-21: is difficult to interpret. All of the overlapping colors and patterns are confusing. For clarity, the ranges of the ranges of the three subject caribou herds should be depicted on separate maps. ***(Comment No. 196407-091)***

Response To: Comment 196407-091

Map 3-21 has been revised to better show habitat use by caribou herds that use the Planning Area.

TOPIC: CARIBOU

ISSUE: DISTURBANCE

Comment From: Karen Fant (Comment Letter No. 196945)

Inupiat villagers depend upon the caribou of the lake region for their subsistence. Development activities would disrupt caribou calving or force pregnant cows to move to other, less biologically suitable areas to have their calves. Despite rosy reports to the contrary from the oil industry at Prudhoe Bay about caribou which roam through the oil fields, female caribou with their young calves avoid the pipeline and oil development activities. Not only would development in this area upset the delicate balance of the caribou during the calving season, it would disrupt forever the way of life of the people of Nuiqsut village. ***(Comment No. 196945-007)***

Response To: Comment 196945-007

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The DEIS provided no new scientific data to justify reducing the size of the TLSPA with respect to these important caribou habitats. The Preferred Alternative places Teshekpuk Lake caribou at risk of being displaced from their calving grounds and having their movements disrupted during the critical insect season. Significant displacement and disturbance during calving and insect seasons likely would result in declining productivity, resulting in population-level impacts to the herd. A substantial decline in the size of the herd would reduce subsistence opportunities for residents of North Slope communities. ***(Comment No. 197610-022)***

Response To: Comment 197610-022

See response to comment 197617-076 under Caribou

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Demonstrable development-related effects on that portion of the Central Arctic Herd occurring within the oil fields were observed during 1980-2000, despite masking effects of relatively low caribou densities and highly favorable weather on the calving grounds (Wolfe 2000, Cameron et al. 2002, Griffith et al. 2002). Effects on caribou have included shifting of concentrated calving from the Kuparuk oil field to the southwest of the field, and delaying and deflecting movement to and from coastal insect-relief areas (Whitten and Cameron 1983; Dau and Cameron 1986; Cameron et al. 1992; Nelleman and Cameron 1996, 1998; Murphy and Lawhead 2000; Wolfe 2000). ***(Comment No. 197610-036)***

Response To: Comment 197610-036

Oil and gas development has been implicated in lower reproductive success and shifting of calving areas away from oil field developments. These issues, and data suggesting that calving success and caribou movements may not be entirely related to oil field development are discussed in Chapter 4 for each alternative for Mammals, and in the cumulative effects section for Mammals.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Generally, some caribou appear to habituate to the presence of structures in oil fields (Ballard et al. 2000), but not to human presence and vehicular traffic (Nelleman and Cameron 1998). Caribou in the Central Arctic avoided areas within 2.5 mi of roads and pipelines, functionally increasing habitat loss from 2 percent (the immediate footprint of roads and gravel pads) to 29 percent (Wolfe 2000). ***(Comment No. 197610-039)***

Response To: Comment 197610-039

See response to comment 197610-036 under Caribou - Disturbance

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The sensitivity of caribou to human activity and structures is greater during calving than during insect seasons, greater for maternal than nonmaternal caribou during the calving period, and greater during periods of intense insect harassment versus no insect harassment during summer (J. Dau, Alaska Department of Fish and Game [ADFG], Kotzebue, AK, pers. communication, 2002). At Prudhoe Bay, large groups of caribou often crossed roads with traffic and feeder pipelines during intense insect harassment, but were reluctant to do so after insect harassment had abated (Dau, pers. communication 2002). ***(Comment No. 197610-040)***

Response To: Comment 197610-040

See response to comment 197617-076 under Caribou

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Dau and Cameron (1986) clearly showed maternal caribou avoided roads during calving even when traffic levels were low, but nonmaternal caribou did not. In the range of the Central Arctic Herd, where oil development has occurred on a portion of the calving grounds, cows in the late stage of pregnancy and with newborn calves avoided and shifted concentrated calving away from developed areas, including from prime calving and foraging habitat (Whitten and Cameron 1983; Dau and Cameron 1986; Cameron et al. 1992; Nelleman and Cameron 1996, 1998; Murphy and Lawhead 2000; Wolfe 2000). Air traffic also has stressed parturient and postpartum cows and calves (Yokel 1997). ***(Comment No. 197610-041)***

Response To: Comment 197610-041

The Final IAP/EIS has been revised in consideration of your comments. Text was added to Section 4.7.6.9 Terrestrial Mammals, Cumulative Analysis, Impacts from Oil and Gas Development increasing the short term displacement of caribou to, "..(2 ½ miles for parturient females and calves)..."

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Geoff Carroll, ADFG Area Biologist in Barrow, has been the principal investigator monitoring Teshekpuk Lake caribou for many years. He has stated (22 September 2003 memo to his ADFG supervisor) the following concerns

about potential development around Teshekpuk Lake: The TLH has shown strong fidelity to its calving area around Teshekpuk Lake, and caribou that calve in the core area have much higher calf survival than caribou that calve outside the area. In addition, the geography of the area makes it virtually impossible to build structures in the area north, east, or northwest of the lake that would not impede movements to and from insect relief areas. TLH caribou are likely to react even more strongly than CAH caribou to development activities because they are not habituated to them. If development occurs in the calving area, it is likely that TLH will be displaced from the area and structures to the north will interfere with movements to and from insect relief areas. **(Comment No. 197610-048)**

Response To: Comment 197610-048

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Calving Grounds, "The calving grounds of the TLH are primarily in the northern portion of the Planning Area near Teshekpuk Lake. If snowmelt occurs in late spring, more caribou will calve south of the lake than if snowmelt occurs in early spring. Kelleyhouse (2001) reported that the size of the TLH annual calving grounds ranged between 938 mi2 and 1,861 mi2.. Recent calving by the TLH has been concentrated southeast and northeast of Teshekpuk Lake (Prichard and Murphy 2004). Carroll (2001) reported that in 2000 calving occurred all around Teshekpuk Lake and that more calves than usual were seen south and west of the lake. Aerial transect data (1999–2001) agree with telemetry data (1990-2004) that during the calving period, caribou use the entire area around Teshekpuk Lake (Carroll, Pers. Comm.).

The importance of this area to calving caribou is emphasized by observed calving success in abnormal years. The return of pregnant cow caribou to the Teshekpuk Lake area can be delayed in years when the caribou migrate further away during winter, or when snow-pack is deeper than normal and/or spring melt-off is later than normal. When their return to the Teshekpuk Lake area is delayed, more cows than usual drop their calves along the way and this in turn results in lower calving success. During 1996-97 most of the herd migrated much farther south than usual and many cows arrived late to the Teshekpuk Lake area. Only 8 of 21 collared caribou were found in the lake area during calving time and 6 of these calved successfully. Of the other 13 collared cows, only one calved successfully for an overall successful calving percentage of 33 percent. In 2001, heavy snow and a late snow melt-off slowed the migration and only 16 (44 percent) of 36 collared cows calved successfully. Calving success for collared cows that did make it back to the Teshekpuk Lake area in 2001 was much better (88 percent) than ones found outside the area (10 percent)."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Finally, animals from the TLH overwinter in on the Arctic Coastal Plain more frequently and in greater numbers than the CAH. This means that animals from the TLH are more likely to encounter winter exploration than the CAH and will encounter permanent facilities year-round. What are the impacts increasing the frequency of winter encounters between caribou and oil and gas activities? What happens if these impact are spread across a significant portion of the TLH herd instead of on the relatively few stragglers from the CAH that remain on the Arctic Coastal Plain all winter? **(Comment No. 197616-146)**

Response To: Comment 197616-146

The Final IAP/EIS has been revised in consideration of your comments. Additional analysis of potential displacement of caribou due to oil and gas activity has been added to the Chapter four sections that describe potential impacts of the four Alternatives. We specifically mentioned in the DEIS that development in the area would create the potential for year round interactions between the TLH and oil and gas development activities. Since development has not previously occurred in an area where caribou spend the winter there is no analogue to analyze for this situation. We have described the impacts that have occurred, albeit during summer, in the CAH when they were exposed to oil and gas development activities. While some inferences can be drawn regarding potential impacts they are only speculative and we have tried to indicate that.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Specific Concerns: The draft IAP/EIS at 4-210 acknowledges that the impacts of the Preferred Alternative to terrestrial

mammals would be greater than the No Action Alternative because of the larger development scenario. However, it is inferred that the degree of impact would result from developing only "...345 to 4,310 additional acres of habitat..." This example significantly underestimates the potential impacts to mammals such as calving caribou or caribou seeking insect relief. In fact, the TLSPA was reduced by 75 percent from a no-lease or no-surface activity area of 857,860 acres to a no-lease area of 213,000 acres. The reference to a few hundred or few thousand acres only relates to the actual footprint of habitat loss. It must be recognized that Central Arctic Herd caribou were displaced by up to 2.5 mi from development infrastructure during calving. This additional avoidance zone is a substantially greater impact than the direct acres affected by development. An additional concern at Teshekpuk Lake is the highly constricted geography through which caribou must move to find insect relief. Placing an oilfield infrastructure within this geographically constricted region between lakes and coast is likely to further impede caribou movements. ***(Comment No.* 197617-078)**

Response To: Comment 197617-078

The Final IAP/EIS has been revised in consideration of your comments. The following text was added to Section 4.6.9.1 Terrestrial Mammals, Oil and Gas Development Activities, Effects of Disturbance, Caribou, "Some TLH caribou movements during the insect-relief season (late June-August 15) would likely be affected by pipelines and road traffic. The critical part of the movement to the coastal insect-relief area is through the narrow corridor between Teshekpuk Lake and the Kogru River. Caribou must pass through these corridors to get to and from insect-relief areas. The area to the east of Teshekpuk Lake is a particular problem because nearly all of the parturient cows pass through this area either shortly before or after calving (Carroll Pers. Comm.). Any development that occurs on the limited amount of habitat that is used by caribou migrating through this corridor would likely affect caribou movements. Stipulation K-9 designates an NSO area extending from the eastern shore of Teshekpuk Lake approximately 4 miles eastward towards the Kogru Inlet (approximately 116,000 acres). The NSO designation prohibits permanent oil and gas facilities including major rights-of-way such as pipelines and roads. This stipulation should protect enough land to allow caribou use of this major migration corridor. However, pipelines could be allowed in the NSO area north of Teshekpuk Lake and south/southeast of the lake. Careful siting of pipeline and road rights-of-way would still be required to prevent affects on caribou use of this corridor. Additionally, the areas that would be excluded from surface occupancy do not extend to the coast suggesting that there could be some development along the coastline. While a set-back from the coast is stipulated (Lease Stipulation K-6), development in the coastal area would likely impact caribou use of insect-relief areas near the coast, though the number of developments would be restricted by stipulation K-11."

The following was also added to Section 4.4.9.1. Terrestrial Mammals, Oil and Gas Exploration and Development Activities, Effects of Disturbance, Exploratory Drilling, "Functional loss of habitat would be greater than the number of acres indicated, which is the actual development footprint. Wolfe (2000) suggested that when caribou in the CAH avoided areas within 2.5 miles of roads and pipelines, the functional habitat loss increased from 2 percent (the immediate footprint of roads and gravel pads) to 29 percent.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative A, Section 4.3.9.1, Terrestrial Mammals, Effects of Disturbances, Caribou, Page 4-1 10. The following reference, which discusses displacement of calving caribou along the Meltwater and Tarn roads, and discusses the effectiveness of traffic convoying at reducing calving displacement, should be considered as a reference in this discussion and elsewhere in the document. Lawhead, B.E., A.K. Prichard, M.J. Macander, and M. Emers. 2004. Caribou mitigation monitoring for the Meltwater Project, 2003. Third Annual Report. Prepared for ConocoPhillips Alaska Inc., Anchorage, Alaska by ABR Inc. - Environmental Research & Services, Fairbanks, Alaska. 104 pp. This study noted maternal caribou with calves were displaced from the area near both the Meltwater and Tarn roads during and up to two weeks post calving. Very few calves were observed within 2 km of either road during the calving period and densities appeared to be reduced as far away as 4 km. Traffic convoying on the Meltwater road was not effective at reducing calving displacement to less than 2-4 km or reducing the disturbance reactions of caribou within 500 m of the road. ***(Comment No.* 197620-082)**

Response To: Comment 197620-082

The Final IAP/EIS has been revised in consideration of your comments. The reference and information suggested in

Comment From: Geoff Carroll (Comment Letter No. 197988)

So you asked for ways to mitigate effects that could be detrimental to subsistence and access and other things. So basically, the way to mitigate that is to increase the area that is not leased or has no surface activity to include that narrow corridor and the critical parts of the calving area. I think, you know, there may -- there might be some question as to whether development in those areas will have a large population level effect on the caribou. But I don't ***(Comment No. 197988-218)***

Response To: Comment 197988-218

Please see lease stipulation K-9 for a description of the corridor.

TOPIC: CARIBOU

ISSUE: HARVEST

Comment From: State of Alaska (Comment Letter No. 197620)

Harvest. Subsistence harvest of the TLH is year-round, with most occurring between July and October by residents of Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Hope, and Wainwright. It is difficult to determine precise numbers for TLH harvest because not all hunters report their harvest and because most villages may harvest caribou from more than one herd. However, by examining village subsistence harvest studies and using radio-telemetry data to determine the percentage of caribou that are in village hunt areas during harvest season, a reasonable estimate can be made of TLH harvest. During the year 1999-2000 approximately 2,500 TLH caribou were harvested, and an estimated 2,760 TLH caribou were harvested during 2000-2001 in North Slope villages. Harvest from the TLH by sport hunters is generally low and mostly confined to the Colville River drainage. ***(Comment No. 197620-057)***

Response To: Comment 197620-057

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Harvest, " Subsistence harvest of the TLH is year-round, with most occurring between July and October by residents of Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Hope, and Wainwright. It is difficult to determine precise numbers for TLH harvest because not all hunters report their harvest and because most villages harvest caribou from more than one herd. However, by examining village subsistence harvest studies and using radiotelemetry data to determine the percentage of caribou that are in village hunt areas during harvest season, a reasonable estimate can be made of TLH harvest. Approximately 2,500 TLH caribou in 1999-2000, and 2,760 during 2000-2001, were harvested by residents of North Slope villages. Harvest of the TLH by sport hunters is generally low and mostly confined to the Colville River drainage."

TOPIC: CARIBOU

ISSUE: INSECT RELIEF

Comment From: Robert Davison (Comment Letter No. 194259)

In addition to molting geese, the Teshekpuk Lake Surface Protection Area was established to protect habitats used by caribou for calving and insect relief. Although current numbers of the Teshekpuk Lake caribou herd are high, WMI has concerns about the cumulative effects on caribou population size from potential impacts of oil and gas

development and climate change. Oil and gas development appears to have the greatest potential for adverse effects by interfering with caribou moving through narrow corridors from insect relief areas to foraging areas. ***(Comment No. 194259-009)***

Response To: Comment 194259-009

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: State of Alaska (Comment Letter No. 197620)

Summer Distribution. The Teshekpuk Lake area is important as summer range because of prevailing winds and proximity to the coast, river deltas, and lake edge that provide insect-relief habitat and adjacent forage. ***(Comment No. 197620-055)***

Response To: Comment 197620-055

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Summer Distribution, "The Teshekpuk Lake area is important as summer range because of prevailing winds and proximity to the coast, river deltas, and lake edge that provide insect-relief habitat and adjacent forage."

Comment From: State of Alaska (Comment Letter No. 197620)

Map 3-22, Teshekpuk Lake Caribou Herd Insect Relief Areas. The legend for this map or the associated text should clearly explain how fixed kernal probabilities relate to distribution of caribou during the mosquito and oestrid fly seasons. This figure is confusing unless one is familiar with this type of analysis. ***(Comment No. 197620-066)***

Response To: Comment 197620-066

Explanations of fixed kernal probabilities have been added to the Final IAP/EIS in Chapter 3.

TOPIC: CARIBOU

ISSUE: MOVEMENTS

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Specific Concerns: In the 1st paragraph, p. 3-49, under caribou migration, the DEIS states: "After calving, caribou spread out from the calving area to the east, west, and south." According to caribou biologists, this description is incorrect: parturient caribou from the herd migrate north along the narrow corridor of land east of Teshekpuk Lake (G. Carroll, ADF&G, pers. communication, July 2004). During this critical period, cow caribou and calves are highly sensitive to disturbance. This important migration corridor is now protected in the TLSPA, and the Preferred Alternative would open it at great risk to this caribou herd. ***(Comment No. 197610-024)***

Response To: Comment 197610-024

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, Teshekpuk Lake Herd (TLH), Migration, "After calving, most TLH caribou move north of Teshekpuk Lake, with most parturient cows traveling through the narrow migration corridor between the lake and the Kogru River."

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

An additional concern at Teshekpuk Lake is the geographic bottleneck east of the lake through which caribou must move to find relief from insects. Placing oilfield infrastructure within this constricted region, where caribou are forced to pick their way among lakes and between lakes and the coast is likely to further impede their movements. ***(Comment No. 197610-026)***

Response To: Comment 197610-026

See response to comment 197617-076 under Caribou

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

In 6th paragraph, p. 4-210, the DEIS states: "...many caribou movements to coastal insect-relief areas occur to the east of the lake, and therefore would not be affected under the Preferred Alternative, as a region northeast of Teshekpuk Lake would be excluded from leasing." This is misleading because the greatest geographic bottleneck occurs between Teshekpuk Lake and the Kogru River, which would be open for oil development under the Preferred Alternative. Further, this statement underestimates impacts by assuming that the periphery of the no-lease area would not be influenced by adjacent development infrastructure and activities. It is quite possible that caribou movements will be influenced by adjacent developments several miles away. ***(Comment No. 197610-027)***

Response To: Comment 197610-027

See response to comment 197617-076 under Caribou

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Areas on the coast or directly east of Teshekpuk Lake, outside of the no-lease zone, also could influence caribou distribution and movements within the adjacent no-lease zone. Important insect-relief habitat occurs all the way out to the coast and to the east and west of the lake. Fragmenting this habitat with oilfield infrastructure and activities would likely affect caribou movements. Although caribou may move through infrastructure when harassed by insects, they also must move back to prime foraging areas. The movement back to optimal foraging areas could be restricted by industrial infrastructure, thus compromising the nutritional status of individuals and potentially resulting in herd decline (G. Carroll, ADF&G, pers. communication, July 2004). ***(Comment No. 197610-028)***

Response To: Comment 197610-028

See response to comment 197617-076 under Caribou

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Roads and pipelines and the snowdrifts they cause may impede caribou movements between foraging and insect-relief areas or disrupt normal movements, especially if perpendicular to routes (Gilliam and Lent 1982). Groups of >100 caribou, common when under insect harassment and attempting to move to insect-relief areas at the coast, have greater difficulty crossing roads and pipelines than smaller groups (Smith and Cameron 1985). ***(Comment No. 197610-043)***

Response To: Comment 197610-043

See response to comment 197617-076 under Caribou

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

A fourth difference between the CAH and the TLH are the relatively narrow strips of land to the east and west sides of the Teshekpuk Lake that are important travel corridors for caribou moving between the north and south of the lake.141 These are areas where the entire TLH herd may pass through in large groups. We are not aware of any similar pinch points in the CAH's range, so this makes the TLH unique. How would large numbers of caribou react to infrastructure inside these pinch points? It is simply not enough to say that the conventional wisdom about mitigating impacts of industrialization applies to such areas. ***(Comment No.* 197616-145)**

Response To: Comment 197616-145

See response to comment 197617-076 under Caribou

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS states that "...many caribou movements to coastal insect-relief areas occur to the east of the lake, and therefore would not be affected under the Preferred Alternative, as a region northeast of Teshekpuk Lake would be excluded from leasing." This statement underestimates impacts by assuming that the periphery of the no lease area would not be influenced by adjacent development infrastructure and activities. It is quite possible, if not likely, that there would be an influence on caribou movements from adjacent developments several miles away. Areas on the coast or directly east of Teshekpuk Lake (which occur outside of the no-lease zone) could also influence caribou distribution and movements within the adjacent no-lease zone. Important insect relief habitat occurs right up to the coast and east and west of the lake. Fragmenting this habitat with oilfield infrastructure and activities would likely affect caribou movements. Although caribou may move through infrastructure when harassed by insects, they also must move back to prime foraging areas. The movement back to optimal foraging areas could be restricted by industrial infrastructure thus compromising the nutritional status of individuals and potentially resulting in herd decline. ***(Comment No.* 197617-079)**

Response To: Comment 197617-079

Information on insect harassment and the importance of nutritional status is provided in Section Effects of Disturbances, 4.3.9.1 Terrestrial Mammals, Oil and Gas Exploration and Development Activities, Oil Development, Caribou.

Comment From: State of Alaska (Comment Letter No. 197620)

Migration Corridors The sixth paragraph on Page 4-21 0 states that many caribou movements to coastal insect-relief areas occur to the east of Teshekpuk Lake, and therefore would not be affected by oil and gas development activities, as the region northeast of Teshekpuk Lake would be excluded from leasing. However, the critical part of the movement to the coastal insect relief area is through the narrow corridor between Teshekpuk Lake and the Kogru River, an area that would be open to leasing under the preferred alternative. Because of the large number of lakes and small amounts of land in this corridor, caribou, pipelines and roads would have to use this same sparse quantity of land. As caribou have avoided roads with minimal traffic during calving in parts of the current oilfields, structures in this corridor could significantly reduce its functional width. In addition, the area that would be excluded &from leasing does not extend to the three quarter mile coastal buffer except for the eastern side, allowing development relatively close to most of the coastline. Also, pipelines could be allowed in the coastal and lake setbacks, and in the corridor between Teshekpuk Lake and Kogru River. The end result would be an increased potential for oil and gas development activities to significantly affect the use of this migratory corridor. ***(Comment No.* 197620-090)**

Response To: Comment 197620-090

The Final IAP/EIS has been revised in consideration of your comments. The EIS has been revised to reflect your comments. This information was added to the Chapter four sections for each alternative the most detailed description appears in section 4.4.9.1 under Oil and Gas development where we added: The critical part of the

movement to the coastal insect-relief area is through the narrow corridor between Teshekpuk Lake and the Kogru River. This area would be open to leasing under Alternative B. Caribou must pass through these corridors to get to and from insect-relief areas. The area to the east of Teshekpuk Lake is a particular problem because nearly all of the parturient cows pass through this area either shortly before or after calving (Carroll Pers. Comm.). Any development that occurs on the limited amount of habitat that is used by caribou migrating through this corridor would likely affect caribou movements. Development in the corridors could result from oil finds in the area of the corridors or from a pipeline that would come from petroleum finds north of the lake. Under Alternative B, the region northeast of Teshekpuk Lake would be excluded from leasing. However, pipelines could be allowed in the excluded area as a result of technological limitations, economics, logistics, or other factors. The result would be an increased potential for oil and gas development activities to affect caribou use of this corridor. Additionally, the area that would be excluded from leasing does not extend to the coast, except near Cape Halkett, suggesting that there could be some development along the coastline. While a set-back from the coast is stipulated (Lease Stipulation K-6), development in the coastal area would likely impact caribou use of insect-relief areas near the coast.

Comment From: Geoff Carroll (Comment Letter No. 197988)

In addition, there's a narrow corridor of land between the east side of Teshekpuk Lake and the Kogru River, which nearly all the parturient cows must travel through shortly before or after calving to get to insect relief areas. Cows with calves are very sensitive to disturbance, so we have the most important segment of the population passing through this corridor during the time of year when they are halving calves and are most sensitive to disturbance. Development in this corridor and the calving area south of there could have a detrimental effect on the herd. And, of course, Alternative B -- Alternatives B and C open up this narrow corridor which was formerly protected in the original 1998 Plan for a very good reason. And it opens up the critical calving areas to leasing and surface activity, which could all lead to the detriment of the herd. ***(Comment No. 197988-215)***

Response To: Comment 197988-215

Lease stipulation K-9 was developed for the Final Preferred Alternative D in response to this and other similar

Comment From: Joseph Leavitt (Comment Letter No. 197988)

And another thing is, the pipelines, they need to be -- they need to have crossways for the caribou because the caribou I think will just follow the pipeline if they don't want to go under. I think that would be very important if they start development around that area. The caribou have to have a place to get down to the ocean in the summertime for -- from the -- get away from the mosquitos. I've watched -- as a hunter, I've watched caribou when they're migrating. I've watched them cross my snowmachine trail, they don't have any problem with that. But if I walk across their trail, the caribou will immediately turn back, just from the scent of my feet. I've noticed that, I've watched that as -- just from being a hunter. ***(Comment No. 197988-257)***

Response To: Comment 197988-257

Several stipulations and ROPs have been developed in response to concerns regarding pipelines and caribou movements. ROP E-7 and lease stipulation K-5 require ramps or burial in important caribou crossing areas or other design features such as orientation of pipelines that should minimize such impacts.

Comment From: Dora Nukapigak (Comment Letter No. 197990)

My name is Dora Nukapigak, I'm with the Kuukpik Subsistence Oversight Panel. I've been a subsistence hunter since I was eight, when we moved here from Barrow. And my Preferred Alternative is Alternative A because it has the protection of our caribou, our goose molting areas. And the other thing I wanted to say is, I don't see -- within the satellites, I don't see any caribou -- what do you call those? Gosh, that slipped my mind -- critical loops from anywhere from CD-5 to CD-7. That's -- I think it's very important that they have those in place. It's very obvious in the summertime; we could see where the caribous, you know, cross and go to their insect relief area. And I sure would like to see that being implemented with -- I know that, because the height of the pipeline went from five to seven

feet, I know that maybe that's why they're not putting any vertical loops. Maybe they're thinking it's -- the pipeline is high enough. But I think, for the migration of the caribou, that there be some vertical loops for the satellites. And for the future of development in our -- the west of us, I think that's very important that they do those, the seven foot average plus the vertical loops, or maybe some buried pipeline. **(Comment No. 197990-008)**

Response To: Comment 197990-008

Several stipulations and ROPs have been developed to minimize any effects on migrating caribou. Final Preferred Alternative D includes ROP E-7 which requires that pipelines be designed to allow free passage of caribou and subsistence users. The minimum required pipeline height is 7.0 feet, which is increased from 5.0 feet in the 1998 plan.

TOPIC: CARIBOU

ISSUE: POPULATION

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Although the Central Arctic Herd increased from about 5,000 animals in 1978 to an estimated 27,000 in 2000, a population decline occurred from 1992 to 1995, followed by a rebound (Cameron et al. 2002). The National Research Council (2003) suggested that the combined effects of industrial activity and infrastructure and the stress imposed by insects might have contributed to the reduction in size of the herd seen from 1992 through 1995. Cronin et al. (2000) argued that population-level impacts from oil field development have not occurred for this herd. However, comparing the higher growth rate of the Teshekpuk Lake Herd to the growth rate of the Central Arctic Herd, Griffith et al. (2002) suggested that the Central Arctic Herd might have been influenced by development infrastructure after approximately 1987. **(Comment No. 197610-037)**

Response To: Comment 197610-037

The Final IAP/EIS has been revised in consideration of your comments. The following information and references provided in the comment were added to Section 4.6.9.9 Terrestrial Mammals, Impacts from Oil and Gas Development in the EIS, "Road construction would increase access to previously undeveloped areas and could increase hunting pressure on terrestrial mammals from public and subsistence hunters. The overall number of animals taken would not increase dramatically, but roads could focus hunts in particular portions of the Planning Area and the North Slope. Hunting pressure and harvests have increased for many wildlife species near the TAPS since its construction but have not produced adverse population effects (TAPSO 2001). It is unlikely that the more remote roads associated with oil and gas development on the North Slope would have as great an effect on wildlife populations as occurred along the TAPS corridor."

The following information was also added in subsequent paragraphs, " The National Research Council (2003) suggested that the combined effects of industrial activity and infrastructure, and the stress imposed by insects, might have contributed to the reduction in size of the herd seen from 1992 through 1995. Cronin et al. (2000) argued that population-level impacts from oil field development have not occurred for this herd. However, comparing the higher growth rate of the TLH to the growth rate of the CAH, Griffith et al. (2002) suggested that the CAH might have been influenced by development infrastructure after 1987."

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 3, Affected Environment, Section 3.3.7, Mammals, Caribou, Teshekpuk Lake Herd TLH), Page 3-48. Population Status and Range. The primary range of the TLH is the North Slope west of the Colville and Itkillik Rivers, with peripheral range sometimes extending south of the Brooks Range as far as the Nulato Hills and as far east as the Arctic National Wildlife Refuge. After the decrease in the herd estimate in 1995 (25,076 caribou), the count of the TLH then increased in 1999 (28,627 caribou) and in 2002 (45,166 caribou). It is most likely that the 1999 count was an underestimate and that the herd has gradually increased since the mid 1990s. **(Comment No. 197620-052)**

Response To: Comment 197620-052

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Population Status and Range, "The primary range of the TLH is the North Slope west of the Colville and Itkillik rivers, with the peripheral range sometimes extending as far south as the Nulato Hills of the Brooks Range and as far east as the Arctic National Wildlife Refuge."

Comment From: Wayne T. Gilchrest (Comment Letter No. 197984)

Further, the preferred alternative would diminish protection for the caribou by opening up part of their critical calving and insect relief areas. Most of the concentrated calving area and insect relief area would now be open to leasing and industrial development in contrast to the 1998 plan, which protects most of the concentrated calving area. The National Academy of Sciences reports that, between, 1998 and 2001, reproductive success for female caribou contending with industry activities and high insect populations during calving season was less than for undisturbed females, contributing to an overall population reduction. According to data from the Alaska Department of Fish n Game and University of Alaska-Fairbanks, analyzed by the National Audubon Society, 88 percent of the Teshepuk Lake herd's concentrated calving area would be at risk under BLM's preferred alternative. Additionally, only 41 percent of insect-relief habitat would be protected from leasing and industrial development. ***(Comment No. 197984-004)***

Response To: Comment 197984-004

Your comments and others like it have prompted BLM to consider a new alternative that provides increased protection to the caribou in the area.

TOPIC: CARIBOU

ISSUE: RANGE

Comment From: State of Alaska (Comment Letter No. 197620)

Fall and Winter Range Use and Distribution. During most years, most TLH caribou winter on the coastal plain, but portions of the herd may also winter in a variety of other places. In some years, some of the herd has migrated as far as the Nulato Hills to the south, Point Hope to the west, and the Arctic National Wildlife Refuge to the east. ***(Comment No. 197620-056)***

Response To: Comment 197620-056

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Fall and Winter Range Use and Distribution, "During most years, the majority of TLH caribou winter on the coastal plain of the National Petroleum Reserve – Alaska, but portions of the herd may also winter in a variety of other places. In some years, portions of the herd have migrated as far as the Nulato Hills to the south, Point Hope to the west, and the Arctic National Wildlife Refuge to the east."

TOPIC: COASTAL ZONE MANAGEMENT

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 3-97: the discussion concerning the Alaska Coastal Management Program must be modified to account for significant 2003 amendments of the state's program, and subsequent required amendments of applicable regulations and local district programs. ***(Comment No. 196407-088)***

Response To: Comment 196407-088

The text discussing the Alaska Coastal Management Program has been changed to note the recent amendments to the program.

Comment From: State of Alaska (Comment Letter No. 197620)

DNR Office of Project Management and Permitting Page 3-97 3rd paragraph. The listed federal authorizations referenced in 15 CFR 930.53(a)(l) are found in 11 AAC 110.400. (Activities requiring a federal authorization subject to consistency review.). It may be helpful to list both state and federal regulatory citations in this section describing the ACMP. ***(Comment No.* 197620-103)**

Response To: Comment 197620-103

We have added state regulation to sentence to read: "Federally permitted activities in the coastal area of National Petroleum Reserve – Alaska must undergo an ACMP review if they require a listed federal authorization (15 CFR § 930.53[a][(1]; 11 AAC § 110.400)."

Comment From: State of Alaska (Comment Letter No. 197620)

Pages 4-149.4-238, and 4-3 17. These sections are correct in citing ACMP Statewide Standards at 6 AAC 80 that are currently in effect, however; these sections should note that 6 AAC 80 has been amended and new statewide standards are now at 11 AAC 112, but implementation of the new standards is pending approval by the Office of Ocean and Coastal Resource Management. ***(Comment No.* 197620-104)**

Response To: Comment 197620-104

We have added the following sentence to first instance in Chapter 4: "Pending approval by the Office of Ocean and Coastal Resource Management, 6 AAC § 80 will be amended and new statewide standards will be in 11 AAC § 112."

TOPIC: CONSULTATION WITH FEDERAL AGENCIES

Comment From: Ron Kim (Comment Letter No. 197611)

The EIS for this project also reveals that Preferred Alternative B could harm and potentially jeopardize the existence of the Bowhead Whales, and Steller's and Spectacled Eider, who are protected by the ESA. The BLM should engage in Section 7 consultation with FWS about potential impacts to these species. The potentially detrimental effects of the project on the Bowhead Whales should be further investigated, particularly the potential impact of an oil spill and the effects of sound on the Whales; the ESA and MMPA should make the BLM reconsider interfering with the whales' migration path. ***(Comment No.* 197611-004)**

Response To: Comment 197611-004

As required under Section 7 of the Endangered Species Act, BLM is consulting with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to assure protection of listed species and their critical habitats. This consultation is briefly discussed on page 1-16 of the Draft IAP/EIS. Appendix D of the IAP/EIS includes copies of the letters initiating Section 7 consultation and the Biological Assessment on threatened Steller's and spectacled eiders prepared for consultation with the Fish and Wildlife Service.

Comment From: Environmental Coalition (Comment Letter No. 197617)

E. FISH The Essential Fish Habitat Section 4.3.7.3 claims that the proposed activities are not likely to affect salmon

Essential Fish Habitat ("EFH"). However, the EFH requirement applies not only to salmon, but also to other marine habitat, whether or not the North Pacific Fisheries Management Council has elected to address other species and their habitat. Thus, this Section is incomplete. In its analysis, BLM must apply the Magnuson-Stevens Act's definition of EFH without regard to the Council's designation. So using the definition, it will be apparent to BLM that there is substantially more habitat that qualifies as EFH with and near the Planning Area. Impacts to that habitat must be analyzed. ***(Comment No. 197617-110)***

Response To: Comment 197617-110

The Magnuson-Stevens Fisheries Conservation and Management Act (MSA) is the principal federal statute providing for the management of U.S. marine fisheries. The MSA mandates the regional councils develop Fisheries Management Plans (FMPs) as the primary fisheries management tool. FMPs describe and define EFH for each life stage of managed species. The North Pacific Fisheries Management Council (NPFMC) has jurisdiction in Alaska and to our knowledge the council has not implemented FMPs nor do they actively manage fisheries associated with any Beaufort Sea stock, excluding salmon. In terms of EFH, it does make a difference whether the NPFMC designates a stock as an actively managed fishery.

Comment From: Environmental Coalition (Comment Letter No. 197617)

FAILURE TO MEET THREATENED AND ENDANGERED SPECIES OBLIGATIONS BLM and USFWS have failed to ***(Comment No. 197617-132)***

Response To: Comment 197617-132

As required under Section 7 of the Endangered Species Act, BLM is consulting with the U.S. Fish and Wildlife Service to assure protection of listed species and their critical habitats. This consultation is briefly discussed on page 1-16 of the Draft IAP/EIS. Appendix D of the IAP/EIS includes copies of the letter initiating Section 7 consultation and the Biological Assessment on threatened Steller's and spectacled eiders prepared for consultation with the Fish and

Comment From: Susanne C. Moser (Comment Letter No. 197621)

It would be a huge mistake to risk the internationally significant ecological resources of Teshekpuk Lake for a short-term supply of energy, especially when we know that the United States cannot drill its way to energy independence. ***(Comment No. 197621-007)***

Response To: Comment 197621-007

Subsequent to the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the analyses in the 2003 Northwest National Petroleum Reserve IAP/EIS and the 2004 EIS on the Alpine Satellite Development Plan indicate that oil and gas leasing, exploration, development, and production activities with appropriate mitigation measures can occur in the National Petroleum Reserve-Alaska without significant impacts to wildlife. Operational experience with exploration in the National Petroleum Reserve-Alaska supports that conclusion. As required under Section 7 of the Endangered Species Act, BLM is consulting with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to assure protection of listed species and their critical habitats. The Teshekpuk Lake area has been designated as a Special Area in recognition that significant surface resources are present and that during oil and gas exploration, the area should be managed to assure maximum protection of identified surface values to the extent consistent with the requirements of the Naval Petroleum Reserve Production Act (NPRPA). The near-term energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas production, conservation measures, and other energy sources such as wind, solar, geothermal, hydroelectric, and nuclear. Each source makes a contribution to satisfying energy needs and each has technological, ecological, and economic advantages and disadvantages. In the period considered by the proposed action in this Draft IAP/EIS, fossil fuels will continue to be the single largest component of the domestic energy stream. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National Petroleum Reserve-Alaska. As discussed on page 4-13 of the Draft IAP/EIS, the process of

leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale and the start-up of production from any discovered oil fields in the National Petroleum Reserve-Alaska.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Agency Consultation. The Final EIS should describe how and when resources and regulatory agencies would be consulted in a timely manner as decisions are made during implementations of stipulations and ROPs. We recommend that Final EIS describe how a project proponent and the BLM would coordinate with other decision makers in a timely manner, including the minimum time period required for notifications and consultation. EPA also recommends the BLM carefully review all of the proposed mitigation measures and verify with the appropriate resource and regulatory agencies that the proper notifications are specified. **(Comment No. 197632-010)**

Response To: Comment 197632-010

Please see Section 2.6.2.1, Stipulations and Required Operating Procedures Exception Process, for a complete description of the BLM's Permitting/Authorization Process.

Comment From: Charles Brower (Comment Letter No. 197980)

Small points in definitions can have big impacts on management. A definition of consultations must never include one party simply "informing" another of its intentions. Gravel mine sites must be recognized as permanent facilities, and be subject to all restrictions on the placement of such facilities. **(Comment No. 197980-021)**

Response To: Comment 197980-021

"Informing" another of one's intentions does not mean that the opportunity for further communication is not possible or precluded. This general definition of consultation does mean that at a minimum "informing" interested parities of a proposed action must occur and if deemed necessary, will initiate further consultation. If informed parties have no issues and do not wish to participate in further discussion, that is there choice, and "consultation" may be complete.
Regarding subsistence consultation, the requirements for this process are much more extensive and are described under Required Operating Procedure H-1.

TOPIC: CULTURAL RESOURCES

Comment From: Environmental Coalition (Comment Letter No. 197617)

In the draft IAP/EIS, BLM repeatedly makes reference to the fact that BLM is unsure about the severity of impact on cultural resources that would come from oil exploration and development, citing the scattered natural of the cultural deposits and the unknown locations of many deposits. However, in each case BLM acknowledges that such activities may have an impact on cultural resources. In addition, the draft IAP/EIS notes that the more oil and gas associated activities, the greater the chance that locales of cultural resources would be impacted. **(Comment No. 197617-115)**

Response To: Comment 197617-115

As stated in the EIS, as each undertaking is proposed, Section 106 will be required to identify cultural resources in the affected area (APE).

Comment From: Environmental Coalition (Comment Letter No. 197617)

In addition, BLM acknowledges that the single greatest potential impact to cultural resources in the Northeast

Planning Area is the construction of a permanent road both in terms of lineal coverage of ground and excavation of gravel yet the impact analysis fails to include all of the roads authorized by the proposed action. This failure is detailed earlier in these comments. For these reasons, cultural resource-specific stipulations and protections must be more adequately present in the chosen alternative. ***(Comment No.* 197617-116)**

Response To: Comment 197617-116

There have been no authorization(s) for the construction of roads in this amendment process. Any authorization of such a development proposal would come subsequent to leasing, during the permitting phase. At this time new mitigation to protect cultural resources would be developed as appropriate based upon site and project specific information. Please see Section 2.6.2.1, Stipulations and Required Operating Procedures Exception Process, for a complete description of the BLM's permitting/authorization process.

TOPIC: CUMULATIVE IMPACTS AND ANALYSES

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

There must be some mechanism for recognizing and mitigating the potential cumulative impacts of multiple industrial operations within and outside of the Planning Area. The oil industry has made progress in being able to develop with a smaller footprint, but it is predicted that oil in NPR-A will be found in many small fields, resulting in a web of wells, pipelines, and roads. This expanding web of development will create incremental and increasingly significant cumulative impacts on wildlife and subsistence hunting.

ConocoPhillips' Alpine Production facility now sits just eight miles north of Nuiqsut in the Colville River Delta. The western reach of the sprawling Prudhoe Bay/Kuparuk oilfield complex is less than 25 miles east of the community. The Meltwater facility lies less than 20 miles to the southeast. There has already been extensive leasing and exploration west of Nuiqsut in the Northeast NPR-A Planning Area. When Alpine was being planned, the company at the time said that foreseeable development did not include any further construction in the Colville River Delta. Now agencies, the Borough, and the community of Nuiqsut are considering the Alpine Satellite Development Project that would place production pads in the Delta and the NPR-A. There have already been subsistence effects associated with existing facilities and operations. Hunters have been excluded from traditional hunting areas. Even where hunters have not been specifically prohibited from entering industrialized areas, they have largely avoided hunting in the vicinity of oil and gas facilities. There is already significant anxiety, tension, and stress within the community of Nuiqsut related to the continued expansion of oil and gas facilities into traditional subsistence areas. Among some residents, there is a sense that cultural systems are breaking down. There are divisions regarding how best to deal with both the effects and opportunities associated with expanding industrial development, and over what the community's role should be in the process. There is a need for steady cash employment, but industry jobs take residents away from their families, communities, and cultural activities and responsibilities. There have been persistent concerns over air quality and the overall effects of industrial operations on the health of residents. All of this must be more fully addressed in the EIS. ***(Comment No.* 196407-043)**

Response To: Comment 196407-043

A discussion of the impacts of development in the Planning Area on air quality, subsistence, and social and cultural systems was provided in the Air Quality, Subsistence, and Sociocultural sections in Chapter 4 for each alternative. Section 4.6, Effects of the Cumulative Case, identifies past, present, and proposed development on the North Slope and potential for impacts to subsistence and sociocultural systems from development on the North Slope.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Repeated conclusions under the majority of resource categories in the Draft Plan that the cumulative effects would be similar under all three alternatives are simply baffling, and indicate a failure in analysis. At a minimum, each successive alternative would contribute greater impacts to the cumulative case within the planning area, and would

also stimulate and facilitate greater development and associated impacts outside, and predominantly west of, the planning area. ***(Comment No. 196407-047)***

Response To: Comment 196407-047

For Biological Resources there are clear statements and clear distinctions that indicate that the preferred alternative and alternative C would have greater impacts than would the No action alternative and that alternative C would be greater than for the preferred alternative B in the DEIS. These are clearly stated for vegetation, fish, terrestrial mammals (particularly caribou), and marine mammals. The distinction among alternatives in the birds section is less obvious, and we have revised the text to make the distinctions among alternatives clearer.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-34, last paragraph: this whole paragraph is misleading and confusing. We strongly disagree with the conclusion that "it is not anticipated that the revisions would create different impacts from what might occur given the current stipulations". Clearly, to the extent that the conversion from prescriptive to performance-based mitigation is intended to allow more flexibility and greater opportunities for exploration and development, there will be greater impacts. Also, as stated, making more lands available for leasing may lead to greater development. It must be recognized then that greater development would, in turn, contribute to greater cumulative impacts throughout the region. Finally, we find the statement that "it is speculative to estimate or analyze the impacts of leasing that has not yet been authorized" bizarre. We thought that was the whole reason an EIS has been produced. ***(Comment No. 196407-078)***

Response To: Comment 196407-078

See response to comment 196407-011. Section 2.9 has been rewritten to clarify its intent.

Comment From: Steve Zack (Comment Letter No. 196561)

The dearth of information the cumulative effects of two issues in particular oil and gas development and climate change -- on wildlife, particularly shorebird distribution patterns, are poorly considered in this IAP/EIS, and make any real consideration of further development premature. ***(Comment No. 196561-005)***

Response To: Comment 196561-005

The cumulative effects section has been revised to more substantially consider the impacts of oil and gas development as well as climate change on the natural surface resources of the entire North Slope, but specifically focused on the Northeast planning area.

Comment From: Steve Zack (Comment Letter No. 196561)

The Wildlife Conservation Society is a science-driven conservation organization. We are collaborating with others to evaluate whether there is an effect of oil development on nesting shorebirds and waterfowl. In this light, we strongly feel that existing information on wildlife species and wildlife habitat was poorly integrated in this IAP/EIS. There is no real effort to imagine and integrate concerns over cumulative effects from the ever-growing infrastructure and activities related to oil development on the North Slope. That the IAP/EIS did not thoroughly and realistically address potential and actual environmental impacts means that the proposed alternatives cannot be meaningfully assessed. ***(Comment No. 196561-009)***

Response To: Comment 196561-009

The cumulative effects section has been revised to more substantially consider the impacts of past, present, and future non-oil and gas as well as oil and gas development on the natural surface resources of the entire North Slope,

specifically focused on the Northeast planning area.

Comment From: Steve Zack (Comment Letter No. 196561)

Finally, and most important, the recent National Academy of Sciences report, "Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope (2003)" makes clear that although there are several solid individual studies of how oil activity affects the arctic coastal plain wildlife and environs, yet there is no assessment of the potential cumulative effects in this IAP/EIS. Recently, Assistant Interior Secretary Rebecca Watson told a coalition of conservation groups that the department had told lower 48 Bureau of Land Management state and regional officers they have the right to defer leasing until effects on wildlife are studied more thoroughly. We ask for similar consideration in the NPR-A. ***(Comment No.* 196561-012)**

Response To: Comment 196561-012

The NRC 2003 provides the most up to date assessment of cumulative effects of oil and gas development on the North Slope and was used extensively for the analysis that appears in chapter 4 of the draft and final IAP/EIS.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

General Comments: The significance of observed short-term effects on Arctic caribou from oil exploration and development is debated by the oil industry because some caribou still use habitats within the Prudhoe Bay and Kuparuk oil fields, especially during the post-calving period (Cronin et al. 2000). It is clear, however, that potential long-term and cumulative effects on caribou nutrition, reproduction and mortality may be significant (Wolfe et al. 2000, Griffith et al. 2002, Cameron et al. 2002, NRC 2003). ***(Comment No.* 197610-035)**

Response To: Comment 197610-035

The Final IAP/EIS has been revised in consideration of your comments. We have added additional analysis to the Chapter 4 sections that deal with impacts associated with oil and gas development under each of the Alternatives. This new analysis addresses studies done over the last decade have indicated that TLH caribou show high fidelity to the calving area near Teshekpuk Lake and that caribou that calve in the traditional calving area have much higher calving success than caribou found outside the area. In the cumulative effects section we have added more detailed information regarding oil and gas development on the North Slope that could result in a long-term displacement and/or functional loss of habitat for CAH, TLH, and WAH caribou over the productive life of the leases. At present, cumulative oil development in the Prudhoe Bay-Kuparuk area has caused displacement of CAH caribou from a portion

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Assessment of cumulative impacts for any development within any portion of the range of the Teshekpuk Lake caribou must reflect current vulnerability to weather stress (Carroll 2002) and include all biological factors noted above and cumulative effects of all development and industrial growth in the western Arctic and throughout the range of Teshekpuk Lake caribou. Nellemann and Cameron (1998) described a reduction of caribou tolerance to disturbance as development complexes grew. ***(Comment No.* 197610-047)**

Response To: Comment 197610-047

The Final IAP/EIS has been revised in consideration of your comments. The following information was also added in subsequent paragraphs, " The National Research Council (2003) suggested that the combined effects of industrial activity and infrastructure, and the stress imposed by insects, might have contributed to the reduction in size of the herd seen from 1992 through 1995. Cronin et al. (2000) argued that population-level impacts from oil field development have not occurred for this herd. However, comparing the higher growth rate of the TLH to the growth rate of the CAH, Griffith et al. (2002) suggested that the CAH might have been influenced by development infrastructure after 1987."

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Moreover, one of the concerns missing from the DEIS is the cumulative, synergistic effects of oil development and climate change. The advance of woody vegetation (e.g., Sturm et al. 2001) in the Arctic may shrink the area of optimal habitat for molting geese, which, in combination with oilfield infrastructure and on-going disturbance, especially by aircraft, could displace molting geese from what is now an optimal environment north and east of the lake. Such displacement would almost certainly result in smaller populations, especially for brant. ***(Comment No.*** **197610-063)**

Response To: Comment 197610-063

See response to comment 196561-009 under Cumulative Impacts and Analyses

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

On p. 4-381, the DEIS states "There would be minor differences in cumulative effects to birds under the alternatives." There is no justification for this statement, and we strongly disagree. Alternative A protects the TLSPA—857,860 acres—from leasing or surface activity. Alternative B protects only 213,000 acres—a 75 percent reduction compared to Alternative A. Alternative C opens all the area to leasing. In our opinion, the stipulations proposed by BLM for protection of birdlife in leased areas do not begin to compensate for the loss of protection resulting from the opening of increased area to oil development. The differences in cumulative effects among the three alternatives are substantial, and the document fails to provide a scientifically credible cumulative-effects analysis. ***(Comment No.*** **197610-070)**

Response To: Comment 197610-070

The Final IAP/EIS has been revised in consideration of your comments. In Section 4.6.9.8 Birds, Cumulative Analysis, The word "minor" was deleted from the sentence, "There would be differences in cumulative effects to birds under the various alternatives."

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

As the nation's steward of this region it is incumbent upon BLM to examine all facets of exploration and the long term impacts it might have on the natural and cultural resources in the area under consideration. Therefore, a full review of the 1998 plan should be undertaken by BLM, prior to any changes made to the NE Reserve plans. ***(Comment No.*** **197614-006)**

Response To: Comment 197614-006

We believe that through this amendment process, we are undertaking a review of the areas currently unavailable to oil and gas leasing as well as the current stipulations of the 1998 ROD in order to assess if decisions relating to the current management practices should be modified.

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

The NRC report illustrates the inadequate and superficial nature of the cumulative effects analysis completed in the 1998 NE Reserve FEIS. That SEIS states BLM must adequately determine and describe the potential long-term cumulative effects of oil and gas development on wildlife, ecosystems processes, as well as the cumulative social impacts on residents. This analysis must include a discussion of the impacts from potential activities on adjacent state land, private lands as well as state and federal offshore leases in the Beaufort Sea. BLM has yet to effect this analysis. ***(Comment No.*** **197614-012)**

Response To: Comment 197614-012

The cumulative analysis addresses past, present, and reasonably foreseeable activities in the planning area as well as elsewhere on the North Slope and in the Beaufort Sea.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

All that the Amended Draft EIS has to say about the cumulative impacts of subsistence user avoidance is: The continued expansion of this activity [oil and gas development] across the Arctic Coastal Plain from Prudhoe Bay westward could increase the area considered off-limits by resource users . ***(Comment No.*** **197616-176)**

Response To: Comment 197616-176

The Final IAP/EIS has been revised in consideration of your comments. The end of 2nd paragraph p. 4-402 now reads: "Development along the north side of Teshekpuk Lake, and outside the area closed to leasing, could deflect or divert caribou hunted in that area by Barrow, Atqasuk, and Nuiqsut residents (SRBA 2003b). Allowing development into the core areas now off-limits at Teshekpuk Lake would dramatically decrease core areas where these kinds of avoidance by definition will not occur. Avoidance of additional areas as a result of Stipulation D-2, which allows for the development of permanent facilities for exploration (if that is more economical), will impact the subsistence harvest activities of these communities. Putting a road into NPR-A, with potential public access into the heart of Nuiqsut's remaining traditional range, would have enormous impacts as residents would be likely to avoid hunting in areas with permanent facilities, and would increase competition for subsistence resources with nonlocals.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

That's it. This is not analysis. Instead, it is once again stating the obvious, which is that impacts follow from development. Anyone can tell you that the proportion of Nuiqsut's subsistence range that is avoided because it is occupied by oil and gas infrastructure will only get larger, not smaller. But, where is the analysis of the cumulative impacts that have already mounted from Alpine which is only 8 miles from the village and from the extensive development to the east? What about the cumulative impacts from the likely approval and construction of the Alpine Satellites to the north and to the west of Nuiqsut? We think that it should be pretty obvious that areas in our subsistence range where we can harvest caribou without encountering oil and gas infrastructure are increasing in importance and will continue to shrink in size.173 It naturally follows that additional leasing in the Teshekpuk Lake area, and removing the No-Surface Occupancy strip to the south of the no leasing zone is going to have a profound impact on how and where we hunt. None of this was considered in the Amended Draft EIS. ***(Comment No.*** **197616-178)**

Response To: Comment 197616-178

The Final IAP/EIS has been revised in consideration of your comments with text added to the end of 3rd paragraph (p. 4-402) as follows: "The continued increase in developed area would reduce the land available for Nuiqsut residents

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The avoidance of developed areas by subsistence users has other impacts as well. There is the increased fuel and equipment maintenance costs that hunters incur if they travel farther than normal in order to hunt in an area where oil and gas infrastructure will not be encountered. There is also the time that is taken away from subsistence pursuits to participate in the wage economy in order to pay for these increased costs. These are acknowledged in the Amended Draft EIS as impacts, but there is nothing that even resembles analysis of the increased costs or time taken away from subsistence activities. Such analysis would have to build on a real analysis of the avoidance problem, but even that first building block is conspicuously absent.174 ***(Comment No.*** **197616-179)**

Response To: Comment 197616-179

See response to comment 197616-178 under Cumulative Impacts and Analyses

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Avoidance of additional development (including permanent facilities built for exploration because that was more economical) may also impact hunter success. When that happens, impacts on harvest success will be felt first in the institution of sharing. As the Alpine Satellite Draft EIS points out: The sharing of subsistence foods is essential to the maintenance of family ties, kinship networks and community well being. Disruption of subsistence-harvest patterns could alter these cultural values and affect community social structure. For the system of sharing to operate properly, some households must consistently produce a surplus of subsistence goods. For this reason, the supply of subsistence foods in the sharing network is more sensitive to harvest disruptions than the actual harvest and consumption of these foods by the primary producer. (Emphasis Added.) The sharing of subsistence foods is essential to the maintenance of family ties, kinship networks and community well being. Disruption of subsistence-harvest patterns could alter these cultural values and affect community social structure. For the system of sharing to operate properly, some households must consistently produce a surplus of subsistence goods. For this reason, the supply of subsistence foods in the sharing network is more sensitive to harvest disruptions than the actual harvest and consumption of these foods by the primary producer. (Emphasis Added.) **(Comment No. 197616-180)**

Response To: Comment 197616-180

See response to comment 197616-178 under Cumulative Impacts and Analyses

Comment From: Environmental Coalition (Comment Letter No. 197617)

Under NEPA regulations, an agency preparing an EIS must in the EIS:I identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement. An agency may place discussion of methodology in an appendix. 40 C.F.R. § 1502.24. Throughout Chapters four and five, the draft IAP/EIS fails to identify any methodologies BLM used in undertaking its analyses. This is particularly evident in Section 4.6, concerning Cumulative Effects. There are many possible approaches to analyzing cumulative effects, but the Section does not identify which one, if any, BLM has used. This omission violates 40 C.F.R. § 1502.24. In fact, it is apparent that BLM is not sure how to approach the evaluation of cumulative effects and therefore it never clearly selected a scale with which to do perform the evaluation. The draft IAP/EIS's asserts that: The incremental contribution of the alternatives also depends on the geographic area that is considered under the cumulative scenario. The cumulative impact area could encompass the National Petroleum Reserve-Alaska, the ACP, or the entire North Slope. For some resources, only activities in the immediate area would have effects. For example, well drilling many miles from the nearest river would not be likely to have any effects on wild and scenic rivers. For some resources, activities in a broad area could have a cumulative effect. For example, caribou migrate long distances, and activities occurring in any part of their range could affect them (draft Amended IAP/EIS at 4-416 - 417). **(Comment No. 197617-056)**

Response To: Comment 197617-056

As discussed on pages 416-417 of the Draft Amended IAP/EIS, the BLM did not clearly identify a scale for cumulative effects analysis because a single scale would not be appropriate for each resource. For example, cumulative impacts associated with global warming and some species of birds should be evaluated on a global scale, while cumulative impacts associated with visual resources would be limited to the North Slope. To reduce the potential for confusion in the Final Amended IAP/EIS, the BLM has adopted the approach to cumulative effects analysis adopted by the National Research Council (2003) in its assessment of Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope. This approach is discussed in Section 4.6.2, Understanding and Assessing Cumulative Environmental Effects. As part of this analysis, the appropriate time and space domain in which the relevant actions

Comment From: Environmental Coalition (Comment Letter No. 197617)

Perhaps because the draft IAP/EIS is not adequately site-specific in its analysis, however, after making this statement the Section does not go on to delineate what are the cumulative impact areas for any particular resource. This failure must be corrected in any final EIS. The cumulative effects Chapter is also defective because it is based on a demonstrably unsupported and obviously unwarranted assumption. That assumption is embodied in this statement: ***(Comment No. 197617-057)***

Response To: Comment 197617-057

See response to comment 197617-056 under Cumulative Impacts and Analyses

Comment From: Environmental Coalition (Comment Letter No. 197617)

In addition, the factors (variables) being considered in the cumulative analysis determine the "percentage" that would be attributed to a given alternative. As stated above, the incremental contribution of an alternative to cumulative impacts is assumed to be proportional to the projected level of activities for that alternative. Id. at 4-417 (emphasis added). ***(Comment No. 197617-058)***

Response To: Comment 197617-058

At the level of analysis in the Draft Amended IAP/EIS, both statements are correct. The extent of impacts would be related to the location and timing of the disturbance. When the location and timing of disturbances are known (e.g., summer seismic activities in Teshekpuk Lake), the analysis of impacts in the Amended IAP/EIS is project specific. However, if the location and timing of future disturbances are not precisely known due to the immense size of the Planning Area (4.6 million acres) and variability associated with other factors that can affect the siting and location and time of implementation of a project (e.g., geology, available technology, price of oil, behavior of animals, geopolitical, site access) that can influence the timing and location of disturbances, then assuming that the incremental contribution of an alternative to cumulative impacts is proportional to the projected level of activities for that alternative is reasonable for purposes of analysis. For example, in the NRC (2003:137), potential accumulation of effects from seismic trails on the North Slope was based on rates of recovery that occurred in the Arctic National Wildlife Refuge. The NRC assumed that recovery rates on the North Slope would be similar to those observed in the Arctic National Wildlife Refuge, when in fact, they could be much different depending upon the sensitivity of the lands that are disturbed. As noted in Section 1.13, project-specific NEPA assessments would be conducted as specific projects are identified and tiered to the Amended IAP/EIS. At that time, the proportional assumption would be unwarranted and an analysis of direct, indirect, and cumulative impacts would be related to the location and timing of project-related disturbances.

Comment From: Environmental Coalition (Comment Letter No. 197617)

There is no scientific basis for making this "proportional" impacts assumption, and the draft IAP/EIS pointedly does not identify one. To the contrary, the draft IAP/EIS later admits that for birds, at least, The extent of the impacts of disturbance or habitat loss on tundra nesting birds would be related to the location and timing of the disturbance. The effects of habitat loss related to placement of gravel infrastructure would also depend on the location of the infrastructure and the species and number of individuals in the immediate area. Id. at 4-420. This statement is true, of course, for all other resources, too. And it means that the "proportional" assumption is completely unwarranted and may not be used in analyzing direct, indirect, or cumulative effects. To the contrary, implicit in NEPA's requirement that an EIS be site-specific is the recognition that the type, quantity and quality of effects depends on project and site-specific factors that cannot be generalized and may not be used except, perhaps, in a programmatic EIS that is not intended to analyze or approve specific agency actions. Yet the false assumption of "proportionality" infects the entire cumulative effects analysis in the draft Amended IAP/EIS. This must be changed if any final EIS is to survive scrutiny for consistency with NEPA. This subsection also asserts that: There would be a small increase in the short-term impacts to visual resources from non-oil and gas activities. Short-term impacts, such as green trails, and ongoing activities would not accumulate. Short-term activities do not contribute to overall cumulative impacts on resources,

except in a "momentary" sense. The incremental contribution of these types of activities to cumulative impacts would be zero. Id. at 4-16. ***(Comment No. 197617-059)***

Response To: Comment 197617-059

See response to comment 197617-058 under Cumulative Impacts and Analyses

Comment From: Environmental Coalition (Comment Letter No. 197617)

No analysis or justification is provided for these unwarranted conclusions. Impacts that occur over brief periods of time can still have great significance, and no scientific principle holds that such impacts cannot accumulate and create a cumulative effect, including synergistic effects. ***(Comment No. 197617-060)***

Response To: Comment 197617-060

These two references to the cumulative effect of short-term impacts were removed from the Final Amended IAP/EIS.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The cumulative impacts analysis also is deficient because it does not take into account possible synergistic effects, such as habitat fragmentation from roads and pipelines leading to territorial repositioning by predators into areas where threatened, endangered, or otherwise sensitive prey find favorable habitat. Any final EIS must discuss possible synergistic effects generally and in the context of cumulative effects. ***(Comment No. 197617-061)***

Response To: Comment 197617-061

The Final IAP/EIS has been revised in consideration of your comments. Additional analysis indicates that there is no clear evidence that a synergistic effect would occur from habitat fragmentation. We added to the cumulative effects section: some evidence suggests that habitat fragmentation produced by gravel structures in oil fields may cause reductions in shorebird densities for some species (Meehan 1986) although Troy (1988) found little evidence that fragmentation of tundra habitats affected bird use of areas surrounded by oil field infrastructure. Gravel roads may provide easier access to tundra bird habitats for predators such as Arctic fox and for subsistence hunters.

Comment From: Environmental Coalition (Comment Letter No. 197617)

There is no field-tested data to demonstrate that NPRA will not evolve into a far greater infrastructure of interconnected roads, pipelines, and drill pads, which could have significant impacts on NPRA's wildlife resources. Cumulative analysis should include all facilities, as well as secondary effects of development such as impoundments, dust shadowing, culvert failures and oil spill sites. This kind of trend analysis would show rates of gravel fill and extraction, rates of construction of roads and pipelines, number of drill pads and production pads, and distance between roads, pipelines, and other facilities within each oil field and between oil fields. ***(Comment No. 197617-062)***

Response To: Comment 197617-062

The BLM cumulative effects analyses follows the requirements of NEPA and provides a meaningful analyses of the cumulative impacts from oil and gas activities as well as non-oil and gas activities on the North Slope.

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM's prediction that future impacts may be smaller than past and present impacts is irrelevant to the cumulative impacts analysis. The task of the cumulative impacts analysis is to identify the past and present impacts and explain how they will interact and contribute with the future impacts of this project and other similar activities. Given that

about 1% of oil facilities have been restored, NRC Report at 144, the draft IAP/EIS should not dismiss these past developments—many of these developments are continuing to have effects that are accumulating. **(Comment No. 197617-063)**

Response To: Comment 197617-063

The Draft Amended IAP/EIS did not ignore the cumulative effects from past and present impacts on the North Slope, as discussed in sections 4.6.2 and 4.6.5. In fact, the commenter was critical of the BLM for making a "proportional" impacts assumption for each alternative, when these assumptions took into account past and present activities and how they contribute to future impacts. The Draft Amended IAP/EIS did not take into account restoration of facilities when making these comparisons or assessing cumulative impacts from past and present activities, even though, as acknowledged by the commenter, some past developments have been restored and impacts from these developments do not accumulate.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS also failed to identify why BLM reaches different conclusions about the cumulative impacts of the proposed action than the National Academy of Sciences March 2003 report Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope. A revised IPA/EIS must remedy this situation. **(Comment No. 197617-064)**

Response To: Comment 197617-064

The cumulative analysis section incorporated much information from the National Academy of Sciences report. It is unclear to what differences the commenter refers. Some distinctions, however, may be attributed to the IAP/EIS examining the cumulative impacts associated with leasing in the northeast portion of the Petroleum Reserve, while the NAS conducted a more general examination.

Comment From: Environmental Coalition (Comment Letter No. 197617)

On p. 4-381, the draft IAP/EIS states "There would be minor differences in cumulative effects to birds under the alternatives." We strongly disagree with this statement and believe that the DEIS analysis is fatally flawed. Alternative A, the No Action Alternative, protects the TLSPA—857,860 acres—from leasing or surface activity. The Preferred Alternative only protects 213,000 acres—a 75% reduction compared to Alternative A. Alternative C opens all the area to leasing. The TLSPA is a high density nesting area for many species of waterfowl, loons, and shorebirds. It is also a unique molting area for four species of geese. The differences in cumulative effects between these alternatives is substantial and a revised IAP/EIS must provide a scientifically credible cumulative effects analysis. **(Comment No. 197617-096)**

Response To: Comment 197617-096

The Final IAP/EIS has been revised in consideration of your comments. In Section 4.6.9.8 Birds, Cumulative Analysis, The word "minor" was deleted from the sentence, "There would be differences in cumulative effects to birds under the various alternatives." Additionally, the following text was added to this section, "Birds are not distributed

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM must adequately address the cumulative impacts to marine mammals form leasing 100% of the northwest Planning Area, 965 of the Northeast Planning Area and 97% of the Beaufort Sea. **(Comment No. 197617-109)**

Response To: Comment 197617-109

The cumulative impacts analysis addresses potential foreseeable exploration and development. The EIS includes potential development in the Northwest Planning Area and foreseeable development in the offshore areas of the

Beaufort Sea along with the potential impacts of the proposed alternatives for development in the NE Planning Area.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Page 5, Summary of Impacts: The fourth full paragraph suggests that cumulative impacts are expected to be "minimal, short-term, and localized." The National Research Council (NRC 2003, pages 5-10) suggests that some impacts related to oil development on the North Slope already exceed these levels, and that increased development may exacerbate such impacts. Specific to the Northeast Planning Area, some potential impacts could have other than minimal, short-term, and localized impacts. For example, development in the Goose Molting Area conceivably could result in widespread and lasting displacement of molting Pacific brant, with potential population-level impacts that could effect Alaskan, Canadian and Russian populations and the people in these areas who use the resource, as well as others in the lower forty-eight states and in Mexico. ***(Comment No.* 197618-010)**

Response To: Comment 197618-010

The cited quote refers to cumulative impacts relating to specific resources. The summary goes on to indicate other resources that would have more substantial impacts.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Table 2-3, Page 2-8 1, Cumulative Effects on Birds: The statement that less than 1% of bird habitat on the North Slope would be affected assumes that all land area is equally suitable for birds. This is particularly untrue in the NPR-A, which has some of the highest concentrations of shorebirds of any coastal area on the Slope (Andres 2004). Additionally, it appears that this assessment is based on the "footprint" of potential future development without considering the "zone of influence" around developed areas in which bird populations also may be impacted. ***(Comment No.* 197618-042)**

Response To: Comment 197618-042

This statement has been revised to note that approximately 1% of the North Slope could be directly impacted by oil and gas development, but that activities in the Planning Area could affect proportionally more birds than activities elsewhere on the North Slope due to the larger congregations of birds found in this area than in other areas on the North Slope. The statement in the Draft Amended IAP/EIS addressed habitat availability, not quality, as presumably nearly all, or all areas on the North Slope could provide bird habitat (although some areas undoubtedly have better habitat, and support more birds, than other habitats). An estimate of the "zone of influence" would be difficult to calculate because the "zones of influence" associated with individual, widely-scattered birds would collectively total much more area than the "zone of influence" surrounding a flock of several hundred thousand birds in one area.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.6.3, Page 4-337, Scope of the (Cumulative Case) Analysis: The introduction to the cumulative impacts analysis should state clearly that it will consider loss of breeding, molting, staging, migrating and wintering habitats for migratory birds. ***(Comment No.* 197618-095)**

Response To: Comment 197618-095

The cumulative impacts analysis considered a wide range of receptors, including vegetation, soil, mammals, and migratory birds, as noted in Section 4.6.2 of the Final Amended IAP/EIS. Cumulative impacts to receptors, including migratory waterfowl, were discussed in 4.6.9, Analysis of Cumulative Effects by Resources.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.6.9.8, Page 4-381, Birds, Cumulative Analysis, Paragraph 2: We disagree that there would be only minor

differences in cumulative effects to birds under the Alternatives. Alternatives B and C would almost certainly result in substantially increased intrusion into the Goose Molting Area of the TLSA. As described above, preliminary results of USGS-BRD analysis suggests that since 1999, on average, 47% of molting brant in the TLSA use lakes that would be partially or wholly outside the boundary of the no-lease area proposed under the draft Preferred Alternative (USGS unpubl. data). Similarly, since 1999, on average, 44% of molting greater white-fronted geese and 58% of Canada geese have congregated on lakes in the area that would be available for leasing and development if the draft Preferred Alternative is adopted. Under Alternative C, the entire Goose Molting Area would be open to leasing, with development and related activities allowed within 1/4-mile of all goose molting lakes. **(Comment No. 197618-096)**

Response To: Comment 197618-096

The Final IAP/EIS has been revised in consideration of your comments. In Section 4.6.9.8 Birds, Cumulative Analysis, The word "minor" was deleted from the sentence, "There would be differences in cumulative effects to birds under the various alternatives." Additionally, the following text was added to this section, "Birds are not distributed evenly across the Planning Area and some areas and habitats are more important to some species than others. Areas northeast and northwest of Teshekpuk appear to be areas with high densities of nesting shorebirds, and the Goose Molting Area north of Teshekpuk is extremely important for brant and other molting geese. If these areas were developed, impacts to birds could be greater than those predicted based on amount of disturbance area."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

The Service believes, therefore, that the likelihood of significant impacts (direct, indirect, and cumulative) to molting geese in general and Pacific brant in particular is greater under the draft Preferred Alternative and Alternative C than under the No Action Alternative, and that this constitutes more than "minor differences" in the cumulative effects these alternatives are likely to have on birds in the Planning Area and specifically in the TLSA. This issue needs to be clearly presented and evaluated in the Effects of Disturbance sections (pages 4-382,4-383,4-384, and 4-386) of the final EIS. **(Comment No. 197618-098)**

Response To: Comment 197618-098

Changes were made in Section 4.7.6.8 Birds, Cumulative Analysis to reflect the impacts to geese, in particular Pacific brant based on the comment.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Additionally, the claim regarding only minor differences in cumulative effects between the Alternatives appears to be based on the assumption that only a small percentage of the overall Planning Area is likely to be developed. Without a greater understanding of the distribution of birds throughout the Northeast Planning Area and how this distribution overlaps with future oil development, this conclusion appears unsubstantiated. For example, we have very little information on how different BCC species are distributed throughout the NPR-A. This lack of knowledge prevents us from determining how development would affect wildlife under the various Alternatives. **(Comment No. 197618-099)**

Response To: Comment 197618-099

See response to comment 197618-096 under Cumulative Impacts and Analyses

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.6.9.8, Page 4-386, Birds, Cumulative Analysis, Conclusion, Paragraph 2: The final sentence of this paragraph states that the (cumulative) effects on bird populations resulting from future project infrastructure, including that related to the Alternatives analyzed in the DEIS, would be expected to be less severe than previous developments. While this may be true in a general sense based on improved technologies and a growing understanding of impacts and measures for effectively mitigating them, it is unlikely that this generalization holds true for all bird populations

on the ACP. For example, it certainly is not accurate with regard to potential impacts to molting geese that concentrate specifically within the TLSA. Nowhere else on the ACP would past or future development and related infrastructure be expected to have as great a potential for impacts to populations of molting geese, particularly Pacific brant, as would development that could result from implementation of the draft Preferred Alternative or Alternative C. This needs to be clearly acknowledged and evaluated in the cumulative analysis for the Final EIS. ***(Comment No. 197618-105)***

Response To: Comment 197618-105

The Final IAP/EIS has been revised in consideration of your comments. The last sentence of this paragraph in Section 4.6.9.8 Birds, Cumulative Analysis, Conclusion, was amended to the following, "In general the effects of future project infrastructure on bird populations, although additive to natural effects, would be expected to be less severe than those associated with previous Arctic oil field developments because new technologies have reduced the size of the footprint for current oil field developments. If development-related disturbances affect birds in the goose molting area when large concentrations of geese have gathered to molt, however, impacts could be more severe than those associated with previous developments."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.6.9.9, Page 4-391, Marine Mammals, Cumulative Analysis, Effects of Noise and Disturbance on Polar Bears: Please replace the fourth sentence with the following: "The cumulative effects of these combined disturbances are unknown and will depend on the type, level, frequency, and duration of the disturbance, as well as the number of bears affected. If low numbers of bears are affected, populations would be expected to recover within a year or two." ***(Comment No. 197618-106)***

Response To: Comment 197618-106

The Final IAP/EIS has been revised in consideration of your comments. The sentence from the comment was added to Section 4.6.9.9 Marine Mammals, Cumulative Analysis, Effects of Noise and Disturbance on Polar Bears in the EIS.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.6.9.9, Page 4-392, Marine Mammals, Cumulative Analysis, Effects of Spills: Please add the following text: "The potential for increased dependence on terrestrial habitats by polar bears combined with increased human development from multiple lease sales and subsequent exploration and development within NPR-A and ongoing development at Alpine, Northstar, Prudhoe Bay, and Point Thompson increases risks to polar bears from oil spills. Increased encounters with humans and spilled oil or other contaminants could increase cumulative effects to the polar bear population." ***(Comment No. 197618-107)***

Response To: Comment 197618-107

The Final IAP/EIS has been revised in consideration of your comments. The information from the comment was

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Effects of the Cumulative Case, Section 4.6.9.8, Birds, Cumulative Analysis, Pane 4-38 1. The second paragraph in this section notes there would be minor differences in cumulative effects to birds under the alternatives based on the percent habitat disturbed. Although the percentage of habitat disturbed may not vary greatly among the alternatives, the relative importance of habitat to birds that may be affected differs significantly. The Goose Molting Area, although relatively small in area relative to the entire planning area or North Slope, is extremely important to molting geese. Disturbance or loss of habitat in this area would likely have considerably greater effects to geese than it would in a similar sized area in most other parts of the planning area.

***(Comment No.* 197620-098)**

Response To: Comment 197620-098

The Final IAP/EIS has been revised in consideration of your comments. This paragraph in Section 4.6.9.8 Birds, Cumulative Analysis, Conclusion, was amended to the following, "In general the effects of future project infrastructure on bird populations, although additive to natural effects, would be expected to be less severe than those associated with previous Arctic oil field developments because new technologies have reduced the size of the footprint for current oil field developments. If development-related disturbances affect birds in the goose molting area when large concentrations of geese have gathered to molt, however, impacts could be more severe than those associated with previous developments."

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity, Section 4.8.8, Birds, Page 4-427. This section states disturbances associated with oil and gas activities would likely impact birds during the life of the field but would unlikely continue after field abandonment. If roads, pads, and airstrips are retained at field abandonment, non-industry activities on these structures may continue to provide some level of disturbance to birds. If intensive activities near traditional goose molting lakes causes abandonment of use of these lakes, establishing a timeframe for reestablishment of the molting tradition at these lakes, if it even occurs, is difficult. We recommend the final EIS reflect this perspective. ***(Comment No.*** **197620-099)**

Response To: Comment 197620-099

Although the effects of habitat loss or alteration may remain after the field is no longer active, disturbances related to activities on roads and pads would no longer exist. The following information was added to Section 4.8.8 Birds in the EIS, "These disturbances would likely impact birds during the life of the field, but would unlikely continue after field abandonment; the effects of habitat loss or alteration may continue indefinitely."

Comment From: Robert Franz (Comment Letter No. 197636)

The National Academy of Sciences recently released a report on the effects of development of oil in northern Alaska. They found real and serious negative impacts on wildlife. ***(Comment No.*** **197636-005)**

Response To: Comment 197636-005

This report was used extensively in the preparation of the Draft IAP/EIS.

Comment From: Inupiat Community of the Arctic Slope (Comment Letter No. 197638)

The lack of information in regards to the social and cultural impacts, which are termed as "cumulative impacts" is also a concern for our villages within the North Slope. There are cumulative impacts that have occurred since oil and gas development began on the North Slope thirty years ago. With oil and gas development encroaching closer to the villages, this is a valid concern that needs to be addressed by the United States Government, Bureau of Land Management, since it is for the welfare of the Inupiat residents of the North Slope who are United States Citizens. We are the citizens of the United States that have endured to date, the impacts that have already occurred, and with new development being discussed, we would bear the brunt of this new development also. The quote that was given in the report of the National Research Council follows: "There is a particular need for attention to social and cultural efforts of leasing, exploration, development and production", including the gradual or long term changes that can be expected to take place even in the absence of spills...as well as the broader range of socio-cultural disruptions that can result from a spill and persist for years. And as a corollary, not enough effort has been devoted to the pragmatic question of what steps, if any, could be taken to avoid or lessen harmful consequences. ***(Comment No.*** **197638-006)**

Response To: Comment 197638-006

The text in Final IAP/EIS has been revised in sections 4.7.7.12 and 4.7.7.13 in response to this comment.

Comment From: Brian Moore (Comment Letter No. 197977)

The weight of scientific evidence points towards significant impacts on the wilderness values if this sensitive area is opened, especially for industrial-scale oil and gas drilling and development. The leasing plan announced by the BLM on June 9th ignores the findings of a recent National Academy of Sciences report, "The Cumulative Effects of Oil and Gas Activities on Alaska's North Slope." This report found that oil and gas development on the North Slope has had widespread damaging impacts on the air, water, landscapes, and wildlife of the region and on the health of its people. ***(Comment No.*** **197977-059)**

Response To: Comment 197977-059

The National Academy of Sciences report, "The Cumulative Effects of Oil and Gas Activities on Alaska's North Slope" has been significantly included in the cumulative analysis of the FEIS.

Comment From: Stan Senner (Comment Letter No. 197978)

Another item is that missing from the discussion of cumulative effects and the analysis of cumulative effects, there is no discussion of the interaction with climate change. And one of the phenomena that we're seeing on the North Slope is an invasion of woody vegetation moving farther north. The geese are at Teshekpuk Lake to molt because of the abundance of fine grasses and sedges. Geese are grazers and that's what they need. It's a rich in feeding environment and it's also a relatively predator free and it's also relatively disturbance free. That's why they're there. ***(Comment No.*** **197978-093)**

Response To: Comment 197978-093

The EIS was revised to include more discussion of climate change. Studies have indicated that climate change may cause an increase in woody vegetation on the North Slope (Chapin et al. 1995 was cited in the draft EIS). However, plant succession is a slow process particularly in the arctic (see Billings and Peterson 1980, Bliss and Peterson 1991, and Bliss 2000) and conversion of the large areas dominated by sedges and grasses on the North Slope to areas dominated by woody vegetation, making them poorer quality goose habitat, is likely to take several hundred years or longer. Further the Goose molting lakes north/northeast of Teshekpuk Lake occur in a low lying area that may experience periodic inundation by salt water due to rising sea level caused by climate change. Such inundation and increased salinity would be inhospitable to woody vegetation and would likely cause a shift in the plant community toward salt marsh and salt tolerant species (Funk et al 2004). Salt marsh is considered high value habitat for wildlife and is used extensively by geese. So while climate change may cause an increase in woody vegetation which may result in a decrease in available goose habitat it is just as likely that it could increase available habitat by creating extensive salt marshes. Unfortunately both scenarios are highly speculative.

Comment From: Stan Senner (Comment Letter No. 197978)

If through climate change we see an invasion of woody vegetation in that area, the actual -- the area available to molting geese is going to shrink. And if you then further fragment and diminish that habitat with the infrastructure, the oil industry, that's an interactive or synergistic effect, and I think that the Draft Environmental Statement needs to consider that possibility. ***(Comment No.*** **197978-094)**

Response To: Comment 197978-094

See response to comment 197978-093 under Cumulative Impacts and Analyses

Comment From: Charles Brower (Comment Letter No. 197980)

There must be some mechanism for recognizing and mitigating the potential cumulative impacts of multiple industrial operations within and outside of the Planning Area. The oil industry has made progress in being able to develop with a smaller footprint, but it is predicted that oil in NPR-A will be found in many small fields, resulting in a web of wells, pipelines, and roads. This expanding web of development will create incremental and increasingly significant cumulative impacts on wildlife and subsistence hunting. **(Comment No. 197980-023)**

Response To: Comment 197980-023

The mechanism for recognizing and mitigating the potential impacts of oil and gas activities across the North Slope is addressed in the lease stipulations and ROPs included in the Final Preferred Alternative.

TOPIC: DEVELOPMENT FIELD LAYOUT

Comment From: Conoco Phillips (Comment Letter No. 196557)

Small scale adjustments (< 1 mile) in well pad locations have been used to avoid placing facilities in sensitive or high use habitats on past projects, and CPAI would consider this same process for future development scenarios. With the suggested setbacks from lakes and restrictions on surface occupancy of lakes of high importance to molting geese, CPAI believes that exploration and development can be accomplished with a minimum of impacts especially given that additional site-specific impacts will be evaluated under NEPA for each proposed project. **(Comment No. 196557-033)**

Response To: Comment 196557-033

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 4-22 and 4-23, Chapter 4 Environmental Consequences, Section 4.2, Introduction and Basic Assumptions for the Environmental Consequences Assessment, Section 4.2.1, Ground-impacting Management Actions, Section 4.2.1.2, Oil and Gas Exploration and Development Activities, Figure 4-1 and Table 4-3:The figure shows the satellite pads as requiring 20 acres, but the disturbance of only 10 acres per pad is accounted for in the table. **(Comment No. 196952-009)**

Response To: Comment 196952-009

Table 4-3 and Figure 4-1 have been revised to ensure they are consistent and are similar to development impacts that would occur for facilities at the Alpine field.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Development- Field layout. The draft IAP/EIS presents a muddled picture regarding whether ice roads will be used at all for access for development, given that for practical and economic reasons, winter ice roads are likely to be limited to 50 to 100 mi in overall length and the winter season is shortening. Therefore, the draft IAP/EIS needs to fully assess the environmental impact of construction of permanent gravel roads in the Northeast Planning area. Analysis of the effects of permanent roads, both within oil fields, connecting to satellites, and connecting outside the planning area should have been done since there are no prohibitions of this infrastructure. **(Comment No. 197617-047)**

Response To: Comment 197617-047

The use of ice roads versus permanent roads for development activities is discussed on pages 4-30 and 4-31 of the

Draft IAP/EIS. In the National Petroleum Reserve-Alaska, construction activities would occur during the winter months and would use ice roads to transport heavy equipment and supplies. These seasonal ice roads would connect construction sites to air strips, marine barge docking facilities, and permanent roads such as the State-advocated all-season gravel road from the Spine Road across the Colville River to the border of the National Petroleum Reserve-Alaska. After development and construction, during the production life of a field, short in-field gravel roads would connect production pads and facilities. Gravel roads could also connect nearby fields to one another to allow sharing of infrastructure. During the production life of remote fields, alternative transportation systems such as marine barging and airstrips would provide year-round access and seasonal ice roads would be constructed and used if needed for
specific operations. The potential environmental impacts from the construction and use of permanent gravel roads in the Northeast National Petroleum Reserve-Alaska are evaluated in the Draft IAP/EIS for the appropriate physical, biological, and human resources. These analyses appear under various subtitles such as "Effects from Pad, Road, and Pipeline Construction," "Placement of Gravel Fill," and "Activities on Roads and Pads."

TOPIC: ECONOMY

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

2-87, Effects on the Economy: all of the economic values given, both in terms of revenues and jobs created, must be clearly identified as being highly speculative, rather than certain, as is implied from the language used. Throughout the document, potential adverse impacts on resources and competing uses are described in speculative terms and offset by unsupported assurances that mitigation measures will minimize effects. A consistent treatment of potential positive and negative effects must be utilized in the document. It is inaccurate and misleading to state that certain revenues and jobs would be generated under any alternative. It is also inaccurate to state under the cumulative effects analysis that oil and gas production is the dominant economic activity on the North Slope without further explanation of the meaning of "dominance". It may be the dominant activity in the cash economy, but for the permanent Inupiat residents of the North Slope, subsistence has always been, and will continue to be, the dominant economic activity. Failure to recognize that subsistence is a form of economic as well as cultural activity explains why the impacts to subsistence are so often understated in the document. For our residents, their cash employment supports, rather than is supported by, their subsistence activities. The tax and other revenues generated by oil and gas leasing, facilities, and operations support our communities and allow them to continue to exist in locations chosen long ago exclusively for their proximity to valued subsistence resources. The Borough funds planning and zoning, wildlife management, search and rescue, education, history, cultural, and elder support programs all in support of the continued health and vitality of the subsistence culture of the Inupiat people. Conversely, our health, public safety, and counseling functions address to a great degree the symptoms resulting from stresses on the subsistence culture attributable in part to increasing industrialization. ***(Comment No. 196407-087)***

Response To: Comment 196407-087

The concerns that are raised in this comment regarding: 1) the clarity in the language used in describing the potential or projected economic effects under the various alternatives, and 2) the use of the term "dominant" in describing the value of the oil industry in the North Slope, are acknowledged. Changes to the text were made to make it clear that the economic values are merely estimates based on assumptions about future oil prices and future oil production levels. The term "dominant" on page 2-87 in the Draft Amended IAP/EIS document was replaced with "important" and the value of subsistence activities to the economy and livelihood of the North Slope residents were pointed out in the same section. It should be noted that there are sections in the Affected Environment discussion that highlights subsistence activities in the North Slope communities (starting on page 3-126 of the document under "Subsistence as Part of the NSB Economy").

Comment From: Conoco Phillips (Comment Letter No. 196557)

A simple comparison of Sections 4.4.18 and 4.5.18 and the economic analysis therein shows that important economic effects would be lost by choosing Alternative B over Alternative C and excluding such a significant portion of land from the high prospective area. For example, a comparison of Table 4-11 and Table 4-17 on the estimated

property taxes, royalties and severance taxes at $30 per barrel shows a total loss of $1.75 billion over a 34 year window, as broken out below, including a loss of nearly half a billion dollars each to the North Slope Borough (NSB) and the State of Alaska and more than $600 million to the federal government.
LOST REVENUE ASSOCIATED WITH ALTERNATIVE B

LOST PROPERTY TAXES LOST ROYALTY LOST SEVERANCE
$ MILLION $ MILLION $ MILLION
NSB ALASKA NSB ALASKA FEDERAL ALASKA
$176.5 $14.3 $316.9 $316.9 $633.8 $288.5 ***(Comment No. 196557-018)***

Response To: Comment 196557-018

It is s a good idea to compare the alternatives in terms of lost revenues. This discussion was added to Table 2-3 (Effects on the Economy) on page 2-87.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Table 2-3, Page 2-87, Effects on the Economy: This section should recognize the economic significance of sport harvest (state permits and federal duck stamps) and associated benefits to communities where hunting occurs. If populations of geese are impacted by development-related activities in close proximity to key molting areas, which could occur under the draft Preferred Alternative or Alternative C, then the economic benefits associated with the hunting of these species could be lost or reduced. Similarly, any loss of subsistence opportunities could significantly affect local economies of subsistence hunters on the North Slope and elsewhere in northwest, western and southwest Alaska, as well as those of the extended families and communities with which subsistence hunters share their harvest. ***(Comment No. 197618-046)***

Response To: Comment 197618-046

This issue—the significance of sport harvest and the associated benefits to local communities can be discussed in Recreational and Wilderness Resources. To the extent that there are associated economic benefits to local communities, some discussion was added to the Affected Environment Chapter—under the Economy section to include these values.

Comment From: Joseph Eviklook (Comment Letter No. 197973)

CHAIR BROWER: (Translates a portion) You have come again to Nuiqsut for the same purposes, that the community of Nuiqsut is not going to benefit from any employment opportunities from this proposal. ***(Comment No. 197973-071)***

Response To: Comment 197973-071

The proximity of Nuiqsut to the area of interest (NE NPRA) enhances the community's opportunities to benefit from development and production activities associated with Alternatives B, C, and D. These opportunities could extend to community businesses that might provide goods and services, as well as residents who might obtain work as a result of the development and production activities.

Comment From: Arnold Brower Jr. (Comment Letter No. 197986)

I just wanted to mention that because this community is hard-pressed for heating oil. The economy is not at its -- even at its average. So this is something this community has desired in the past. And if there are natural gas to be found in the vicinity of these Preferred Alternatives, because this is a general location, any way that -- before it goes down to the Lower 48, some of it has to come to the Arctic Slope homes. So we know that the pipeline is going down from Prudhoe Bay to the Lower 48 and it shouldn't -- we share that -- we envy that proposal, to make that gas available for the nation. And we want BLM to know, we're part of that nation. ***(Comment No. 197986-298)***

Response To: Comment 197986-298

Transportation and distribution of natural gas resources is outside the scope of this document.

TOPIC: EDITS

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Map 3-22: likewise, this map is confusing and extremely difficult to interpret. Some colors shown on the map do not appear to match any presented on the key, and it is likely that many in the reviewing public are not familiar with "kernel probabilities". ***(Comment No.*** **196407-092)**

Response To: Comment 196407-092

Map 3-22 was revised to better show insect-relief areas in the Planning Area.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-15: ROP A-3, Requirement/Standard. In last sentence add "field" before "staff" to make clear that only field staff, not all staff including corporate and global company staff, need instruction regarding procedures for hazardous materials contingency planning in the Planning Area. ***(Comment No.*** **196557-047)**

Response To: Comment 196557-047

ROP A-3 is applicable across the planning area for any land use activity, not just oil and gas; and there are a variety of organizations that it would apply to. The level at which an organization believes personnel should be involved is internal to that specific organization and not a decision for the BLM.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-16: ROP A-4f. Add "or his or her designee" after "AO" so that reports of spills within 24 hours of occurrence can be reported to the AO's designee, as is current practice. ***(Comment No.*** **196557-048)**

Response To: Comment 196557-048

This is understood.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-16: ROP A-4g, Identification of Oil Pans. This ROP requires marking oil pans ("duck ponds") with the responsible party's name. While CPAI does not object to this proposed practice it is not appropriate to have this type of detailed control of field operations in an ROP. This requirement is more appropriate for a project-specific Plan of Operations, not as part of an EIS. ***(Comment No.*** **196557-049)**

Response To: Comment 196557-049

We believe this is a necessary component of the Required Operating Procedures for this leasing document and was specifically requested by the citizens of Nuiqsut in the context of government to government consultation.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-18: ROP B-2g. Fish screens are now regulated by the Alaska Department of Natural Resources, no longer by the Alaska Department of Fish and Game. ***(Comment No. 196557-054)***

Response To: Comment 196557-054

The change is noted in the final IAP/EIS.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-18: ROP B-2h. Add "access to water pumping stations on lakes" as approved for compaction of snow cover or snow removal from fish-bearing water bodies. ***(Comment No. 196557-055)***

Response To: Comment 196557-055

If compacting snow to allow access to water pumping stations on lakes is necessary, then access approval would be considered during the permitting process and either approved or not approved by the authorizing officer.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page Executive Summary – 2: The correct name for this association is "Nuiqsut Whaling Captains Association." ***(Comment No. 196557-074)***

Response To: Comment 196557-074

The text was corrected in the Executive Summary.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page Executive Summary – 3: Alternative B (Preferred Alternative). Change the acreage of new oil and gas resources to 347,000 from 487,000. ***(Comment No. 196557-075)***

Response To: Comment 196557-075

The text was corrected in the Executive Summary.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 1-4: 3rd full paragraph. It is incorrect to say the Alpine Project field "...has been the principal target for exploration on leases acquired in the Planning Area". Change to "...similar reservoirs have been the principal target...". ***(Comment No. 196557-076)***

Response To: Comment 196557-076

The text on page 1-4 has been revised to state that similar reservoirs have been the principal target.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 1-9: 3rd full paragraph. Add the U.S. Coast Guard as a cooperating agency for the Alpine Satellite Development Project EIS. ***(Comment No. 196557-077)***

Response To: Comment 196557-077

The U.S. Coast Guard was added as a cooperating agency in Chapter 1.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 1-21. Switch explanatory text next to boxes for #3 Affected Environment and #4 Environmental Consequences. ***(Comment No.* 196557-078)**

Response To: Comment 196557-078

The explanatory boxes in Figure 1-1 have been corrected.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 3-113, 4th full paragraph. The proposed road to pads CD6 and CD7 would extend approximately 22 miles into the Planning Area, not 5 miles as stated. ***(Comment No.* 196557-083)**

Response To: Comment 196557-083

The text on Page 3-113 was corrected to note that the proposed road to pads CD6 and CD7 would extend approximately 22 miles into the Planning Area.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 3-114, 3rd paragraph under Proposed Colville River Road from the Kuparuk River Unit to the National Petroleum Reserve – Alaska. This states that the road and bridge would enable oil and gas companies to develop staging areas to the east of the Colville River. We believe the authors meant "west" of the river. ***(Comment No.* 196557-085)**

Response To: Comment 196557-085

The text on Page 3-114 was corrected to note that the road and bridge would be constructed to allow development of staging areas to the west of the Colville River.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 3-114, Section 3.4.8.2, Aviation Systems. There are only two major airstrips, not three, in the Prudhoe Bay/Kuparuk area; Deadhorse and Kuparuk. The Prudhoe airstrip shut down several years ago. Same comment for 2nd paragraph on page 3-115. ***(Comment No.* 196557-086)**

Response To: Comment 196557-086

The text on Page 3-114 was corrected to note that there are only two major airstrips.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 3-117, Section 3.4.8.6, Ice Roads. States that "villagers have annually constructed an ice road from Nuiqsut to Oliktok or the nearest oil-exploration ice road, whichever is closer." Note that CPAI has built the ice road from Nuiqsut to Kuparuk almost every year since the mid-1990s. ***(Comment No.* 196557-087)**

Response To: Comment 196557-087

Text on page 3-117 was added to note ConocoPhillips has built the ice road almost every year since the mid-1990s.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 4-13, Technology Advancement, last bullet. Note that Anadarko's modular drilling platform is only designed for shallow drilling, much shallower that any exploration well CPAI has drilled or plans to drill. Same comment for 3rd full paragraph on page 4-18. Also in the second line at top of page 4-20, insert "shallow" in front of "exploration drilling". ***(Comment No.* 196557-088)**

Response To: Comment 196557-088

The text on Page 4-13 and 4-18 has been revised to note that the modular drilling platform is only designed for shallow drilling. The word "shallow" has been added on page 4-20.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 4-31, 1st paragraph under Resource Potential and Related Activities. The 2nd and 3rd sentences state: "For the purposes of environmental analysis in this amendment, future petroleum-related activities are assumed to be correlated to the economic resource potential made available through leasing. This implies that all of the modeled petroleum resources will be discovered and developed by industry, which is very optimistic since all of the possible economic resources may not be attractive to industry." This is a critical assumption that should be repeated throughout the environmental analysis sections to remind the reader that the DEIS analyses result in artificially high environmental impacts. ***(Comment No.* 196557-091)**

Response To: Comment 196557-091

The BLM agrees that not all of the modeled petroleum resources will be discovered and developed by industry, because not all of the possible economic resources may be attractive to industry. Numerous factors will dictate if, and what resources would be developed in the future. These scenarios assume oil prices will range from $20 to $30/bbl in the future. If oil prices were to remain near current levels ($50/bbl), however, additional oil resources above those projected to be developed in the Planning Area in the Draft Amended IAP/EIS could become attractive to the oil industry. If so, the Draft Amended IAP/EIS analysis may understate environmental impacts. However, the BLM feels that the resource development scenarios developed in Section 4.2.1 of the Amended IAP/EIS are reasonable and useful for comparing impacts among alternatives.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 4-279. Section 4.5.5 is missing a conclusion section. ***(Comment No.* 196557-098)**

Response To: Comment 196557-098

Section 4.5.5.4 is the conclusion for Section 4.5.5.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 4-344, Table 4-21. The Nanuq (CD-4) field should be moved to the category "Present Development and Production". ***(Comment No.* 196557-101)**

Response To: Comment 196557-101

The Nanuq Field has been included under "Present Development and Production" in Table 4-21.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 4-464. Section 4.11.3 is missing a conclusion section. ***(Comment No. 196557-103)***

Response To: Comment 196557-103

No conclusion section was planned for Section 4.11.3.

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 2-7, Chapter 2 Alternatives, Section 2.3 Description of the Alternatives, Table 2-1:The percentages of land available and restricted for alternative I3 do not add to 100%. The 4.387 million acres is 95.3% of 4.6 million acres, not 97% as reported in the table. ***(Comment No. 196952-002)***

Response To: Comment 196952-002

The table has been modified to reflect your comment.

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 3-12, CHAPTER 3: DESCRIPTION OF THE AFFECTED ENVIRONMENT, Section 3.2.5 Petroleum Resources, Subsection 3.2.5.2 Petroleum Activities in Northern Alaska: In the last paragraph on the page and elsewhere in the text, reference is made to the "Alpine Project field." The correct name, as used by the community (the press, State of Alaska, and technical literature), is "Alpine field. Not using the correct name is confusing. ***(Comment No. 196952-006)***

Response To: Comment 196952-006

References to the "Alpine Project field" have been changed to "Alpine field" in the Final Amended IAP/EIS.

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 3-16, CHAPTER 3: DESCWTION OF THE AFFECTED ENVIRONMENT, Section 3.2.5 Petroleum Resources, Subsection 3.2.5.2 Petroleum Activities in Northern Alaska; Oil and Gas Resource Assessment, fourth paragraph: In the interests of clarity, the 2002 USGS assessment of the NPRA was not done "in cooperation with the MMS" and that assessment does not strictly update the "National Resource Assessment conducted in 1995" because the 1995 assessment did not deal specifically with the NPRA, only with northern Alaska as a whole. ***(Comment No. 196952-008)***

Response To: Comment 196952-008

The reference to the MMS as a cooperator has been deleted. The statement that the 2002 USGS assessment updated the "National Resource Assessment" has also been deleted.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

1.2, Page 1-3, Proposed Action: The first sentence says the Planning Area is 23 million acres; rather this approximates the size of the NPR-A as a whole. ***(Comment No. 197618-014)***

Response To: Comment 197618-014

The text has been corrected to note that the National Petroleum Reserve – Alaska is approximately 23 million acres, of which 4.6 million acres are found in the Planning Area.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

1.3.2, Page 1-6, Authority: The first paragraph refers to the "National" Petroleum Reserves Production Act; here and elsewhere correct as "Naval." ***(Comment No. 197618-015)***

Response To: Comment 197618-015

The text was corrected on page 1-6; this was only instance in which the Act was incorrectly referred to as the National Petroleum Reserves Production Act.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Table 2-1, Page 2-7: Under the Preferred Alternative, this table reports that 97% of the Planning Area would be available for leasing and that 4.6% would be unavailable for leasing; this discrepancy should be corrected. ***(Comment No. 197618-021)***

Response To: Comment 197618-021

Table 2-1 has been revised to show that 95.4% of the Planning Area would be available for development under the Preferred Alternative.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 1, Introduction, Figure 1.1. The text describing the boxes labeled Affected Environment and Environmental Consequences is reversed. ***(Comment No. 197620-046)***

Response To: Comment 197620-046

The explanatory boxes in Figure 1-1 have been corrected.

Comment From: State of Alaska (Comment Letter No. 197620)

The third paragraph describes benthic and fish studies conducted in the North Fork Chandler River. These studies were conducted in the North Fork Chandalar River. ***(Comment No. 197620-077)***

Response To: Comment 197620-077

Text changed to North Fork Chandalar River.

TOPIC: EFFECTS OF SPILLS

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-138, last paragraph: the section mentions, but does not adequately address the issue of resource tainting as a deterrent to harvest. Beyond avoiding consumption of species potentially affected by a spill due to fears of contamination, subsistence users would likely also allow a period for certain species, especially the bowhead whale, to fully recover following exposure to oil. In addition, as discussed above, the EIS must analyze the potential for the Native subsistence harvest quota for bowhead whales to be reduced by the International Whaling Commission in response to a spill or a perception of greater threats to the welfare of the endangered population associated with increased industrialization of their marine habitat and adjacent onshore areas of the NPR-A. The issue is noted in a

single sentence on page 4-144, but warrants additional analysis in light of the recent IWC resolution addressing oil industry threats to the western Pacific gray whale population. ***(Comment No. 196407-100)***

Response To: Comment 196407-100

Add text to page 4-139 after second paragraph, "Subsistence users would likely also allow a period of time for the resources, especially bowhead whales, to recover following exposure to oil." Add text "A large or very large oil spill into nearshore or riverine environments could cause injury or death to bowhead whales, or cause them to move off of their normal course, thereby making them unavailable for subsistence harvest for Nuiqsut and Barrow, and possibly other communities. Such an event could also trigger a reduction in the IWC subsistence bowhead whale quota, causing hardship to all subsistence whaling communities in Alaska, Arctic Canada, and Eastern Siberia." Add to text on page 4-144 after "following a spill (Napageak 1990, NRC 2003). A reduction in IWC bowhead whaling quotas on the North Slope would result in negative subsistence, economic, cultural, and social impacts throughout the region."

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Specific Concerns: Starting on p. 4-104, the DEIS discusses effects of oil spills on birds. We find that the DEIS underestimates the difficulty of cleaning up oil spills in ice conditions that occur on this area for many months. The National Research Council (2003) and others have concluded that oil spilled in broken ice conditions cannot be cleaned up effectively and would represent a serious threat to migrating or staging waterbirds. ***(Comment No. 197610-069)***

Response To: Comment 197610-069

There currently are not any effective ways to mechanically clean up oil spills in broken ice conditions. Should a spill occur under these conditions, it is likely that after pumpable/skimmable quantities were recovered, in situ burning could take place and would be quite effective in removing any remaining oil.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Specific Concerns: On p. 4-104/105, the draft IAP/EIS discussed effects of oil spills on birds. We are concerned that the draft IAP/EIS underestimates the difficulty of cleaning up oil spills in ice conditions that occur on this area for more than half the year. It would be difficult or impossible to clean up a significant marine oil spill prior to the ice-free period. This would represent a serious threat to migrating waterbirds during spring. ***(Comment No. 197617-095)***

Response To: Comment 197617-095

The following information was added to Section 4.3.8.2 Oil and Gas Exploration and Development Activities, Effects of Spills, "Cleanup of spilled oil during ice-covered periods or periods of broken ice may be difficult and lingering oil may be present and may be hazardous to spring migrating birds."

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS portrays that an oil spill is unlikely to reach or occur in the marine waters and therefore unlikely to impact bowheads. The agency reasoning is that the bowhead does not frequent near shore waters often. This reasoning is a broad generalization. In fact, bowhead whales may swim very close to shore on some occasions. Bowheads have been observed feeding not more than 1,500 ft (457 m) offshore in about 15 to 20 ft (4.6 to 6 m) of water. Smaller whales may swim in water depths of 14 to 18 ft (4.3 to 5.5 m). In general, bowhead whales seemed to migrate closer to shore in light ice years and farther offshore in heavy ice years. Furthermore, due to the fact that virtually the entire bowhead population funnels through a relatively narrow area in the Beaufort Sea twice per year, bowheads are more vulnerable to an oil spill here than anywhere else on their range. Migrating bowhead whales can be injured or killed following a marine spill due to oiling of baleen, oil ingestion or contact with skin and eyes. However, like the Steller's eider, lack of data on bowhead whales leads to difficulties in accurately predicting the

effects of an oil spill on bowhead whales. Some suggested impacts include, in addition to the above, adverse effects from inhalation of vapors, contaminated food sources and displacement from feeding areas, irritation of mucous membranes and respiratory tract and absorption of volatile hydrocarbons into the bloodstream, ulcer formation, severe skin inflammation, blood poisoning, damage to eyes from oil collected behind the eyes, serious impacts of oil and tar balls on the baleen and causing blockage between two parts of the bowhead stomach. "Because tar balls may persist in the marine environment for up to 4 years, bowhead whales would not have to be present during an oil release to be affected adversely. Impacts could continue for years" (MMS, Northstar DEIS p. 6.9-27/2). Bowhead whales feed almost exclusively on zooplankton. It is imperative that any impact analysis considers the risks from an oil spill on the bowheads' main food source. **(Comment No. 197617-140)**

Response To: Comment 197617-140

Section 4.10.4.10 Bowhead Whales provides a discussion of the possible effects of a potential but very unlikely very large oil spill on Bowhead Whales. Smaller spills are unlikely to reach marine waters occupied by Bowhead Whales. If spills do reach marine waters, they are unlikely to be in sufficient volume to adversely impact whale populations or their food source.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS fails to draws a conclusion at all regarding impact levels of oil spills on endangered bowhead whales - one of the most important resources to local residents. BLM has not proven that it can respond adequately to a spill; furthermore, it does not fully understand the impacts of such a spill. -BLM must provide a realistic, balanced and scientific analysis regarding impacts to the bowhead from development of the NPRA. **(Comment No. 197617-141)**

Response To: Comment 197617-141

Effects of spills on whales have been addressed in section 4.7.7.10 of the Final IAP/EIS.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.3.8.2, Pages 4-104 and 4-105, Effects of Spills: In the fourth paragraph of this section, the text needs to explain that spills occurring during the broken ice and solid ice periods (over 200 days per year) will likely be difficult or impossible to clean up before the ice free period and could, therefore, represent a hazard to spring migrating birds that land in broken ice areas or open leads containing floating oil. **(Comment No. 197618-072)**

Response To: Comment 197618-072

This point was made in Section 4.3.8.2, however, the following information was added to Section 4.3.8.2 Oil and Gas Exploration and Development Activities, Effects of Spills, "Cleanup of spilled oil during ice-covered periods or periods of broken ice may be difficult and lingering oil may be present and may be hazardous to spring migrating birds."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.8.2, Page 4-207, Effects of Spills: Some lakes within the core goose molting area are connected to marine waters. While these lakes would be deferred from development under Alternative B, they could be impacted by potential oil spills from wells located between the proposed no-lease area and the coast in areas proposed to be open for leasing (E and SE of Pogik Bay (T 18N, R3W-R4W), and SW of Cape Halkett (T 16N, R2W), or from spills in marine waters that originate from increased barge traffic. To reduce this risk, it would be prudent to defer these on-shore sites in the blocks T 18N, R3W-R4W, and T 16N, R2W. **(Comment No. 197618-084)**

Response To: Comment 197618-084

The BLM has established a series of mitigations and NSO restrictions to minimize the impacts of potential oil spills north of Teshekpuk Lake in and around the area you refer to, please see stipulations K-4 Goose Molting Area and K-6 Coastal for a complete description of these stipulations.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.9.2, Page 4-2 1 6, Effects from a Large Spill: Please add the same language as recommended for the same section under Alternative A and note that the probability of a spill would be expected to increase with increasing levels of exploration and development. ***(Comment No.* 197618-090)**

Response To: Comment 197618-090

The Final IAP/EIS was revised with additional text on the effects of a large oil spill in section 4.7.7.9.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.6.9.8, Page 4-385, Cumulative Analysis, Effects of a Large Oil Spill: The first sentence of the first paragraph suggests that any oil spill is likely "to be contained and cleaned up before substantial bird loss can occur." This seems unlikely if the spill should occur during the spring break-up season, when moving ice flows make distribution of containment booms impossible, or in the fall months, when large storms frequently hit the coast. This seems like an overly optimistic assessment of industry's ability to clean up spills should they occur. ***(Comment No.* 197618-103)**

Response To: Comment 197618-103

This statement is referring to a small spill and it is likely that a small spill could be clean up before there was

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

The potential impact of a large oil spill on staging shorebirds on the Colville River Delta also appears to be understated given that between 45,000 and 300,000 shorebirds stage on the delta between the 25 July and 5 September (Andres 1994, Andres, pers. comm.). The uncertainty in these numbers occurs because information on turnover rates of birds is poor (45,000 would be present if birds stayed at least 7 days and 300,000 would be present if birds stayed one day). La r g e numbers of shorebirds could die during this critical staging period should they encounter oil on shorelines through oil exposure and subsequent hypothermia, or indirectly by birds eating contaminated prey or their invertebrate food sources dying (Andres 1994). contamination of sediments and thereby invertebrates could affect intertidal areas (and thus feeding shorebirds) for years to come as has been seen in Prince William Sound. Disturbances such as these could have population-level effects (as opposed to the loss of a few nests as described in the DEIS) because very large number of birds would be affected. ***(Comment No.* 197618-104)**

Response To: Comment 197618-104

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 4.6.9.8 Birds, Effects of a Large Oil Spill, "The Colville River Delta supports thousands of postbreeding shorebirds, the most abundant of which is dunlin (Andres 1994). The arcticola subspecies of dunlin is considered to be highly imperiled (Brown et al. 2001)."

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Section 4.2.2, Oil Spills, Fate and Behavior of Spilled Oil, Spills on Tundra, Pane 4-48. The text states tundra relief is low enough to limit the spread of spills. While relief may be low on portions of the planning area, conditions exist, particularly in spring, that would assist spreading of oil over large

areas. During spring breakup, widespread elevated streamflows and extensive meltwater sheet flow across the tundra surface could easily spread spilled oil over an extensive area. ***(Comment No. 197620-073)***

Response To: Comment 197620-073

The following text was added to Section 4.4.4: "Additionally, in late May or early June, the ice in the northern Alaska rivers breaks up, causing a rapid flood event termed "breakup," that, combined with ice and snow damming, can inundate large areas in a matter of days. A spill during breakup could be spread over a significantly larger area by the flooding water."

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4. Environmental Consequences. Alternative A. Section 4.3.9.1. Terrestrial Mammals, Effects of Spills, Page 4-1 16. The second paragraph notes oiled mammal hair would be shed during summer before winter fur is grown. Depending on the timing of the spill event (e.g., if it occurs in the fall), oiled fur would not be shed until the following summer. The third paragraph notes that spill response activities could displace cow caribou with calves up to 2.5 miles. A citation should be provided for the reference on which this statement is based. ***(Comment No. 197620-083)***

Response To: Comment 197620-083

The Final IAP/EIS has been revised in consideration of your comments. The Section 4.3.9.1 Terrestrial Mammals, Effects of Spills Section was amended according to the comment to state that shedding of oiled fur may not be shed until summer. Additionally, the information on cow displacement by up to 2.5 miles was deleted from the EIS.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative C, Section 4.5.5, Vegetation, Oil and Gas Development Activities. Effects of Spills, Page 4-278. This section notes that a maximum coverage of 4.8 acres would occur if an oil spill were to be a wind-blown mist. There is an apparent discrepancy with this statement and the statements in Section 4.10.4.4, page 4-440 that refer to the December 1993 ARC0 drill site spill that misted an estimated 100 to 145 acres. ***(Comment No. 197620-096)***

Response To: Comment 197620-096

The Final IAP/EIS has been revised in consideration of your comments. This was corrected in the text of all sections that indicated that only 4.8 acres could be oiled based upon the Ott 1997 citation. The text was changed as follows: Most oil spills would cover less than 500 square feet (<0.01 acres). However, a spill event that includes an aerial pressured discharge can cover substantially more area as occurred at an ARCO drill site in 1993 when crude oil misted over an estimated 100 to 145 acres (Ott 1997).

Comment From: State of Alaska (Comment Letter No. 197620)

Alaska Department of Environmental Conservation General Comments Spills. There are more than just hydrocarbon spills that occur on the North Slope. Other spills that are tracked and reported are sewage spills and seawater. Seawater being spilled in a freshwater environment could certainly have adverse effects. Seawater spills can be quite large and have the potential to effect significant area. Also, clean up and containment can be quite different from winter to summer conditions. Sewage spills are usually small and occur during pumping, transferring, or frozen lines and stay mainly on gravel pads. In the summer sewage spill soak into the pad while in winter they rapidly freeze which are relatively easily cleaned up. Final treatment of the affected area is usually to disinfect by using lime or a chlorine solution. ***(Comment No. 197620-105)***

Response To: Comment 197620-105

The following text was added to section 4.2.2: "In addition to hydrocarbon spills, spills of other types of materials are reported and tracked as well. For instance, seawater spills can be quite large and have the potential to effect large areas. Seawater spills to fresh water can have significant impact. Other types of spills that are reported and tracked include spills of sewage and hazardous materials. This analysis focuses on the probability and potential impacts of spills of hydrocarbons."

Comment From: State of Alaska (Comment Letter No. 197620)

Spill classifications (small, large, and very large) should be more in line with historical data. Separate criteria could be added to encompass a "catastrophic" spill (120,000bbl) ***(Comment No. 197620-109)***

Response To: Comment 197620-109

The intent of the oil spill analysis was to provide the reader with insight into the likelihood of spills of various magnitudes. Different studies and analyses have used different spill size categories. Since the expected number of small spills is significantly greater than large or very large spills, addition information is provided for small spills (i.e., the percentages of small spills expected to be less than 25 bbl, less than or equal to 5 gallons, and less than or equal to 1 gallon). Comparison with the analysis in the recent NW NPRA EIS is facilitated by use of the same spill size categorization scheme.

TOPIC: ENVIRONMENTAL JUSTICE

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Environmental Justice, as defined by Executive Order 12898, is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or a socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. Meaningful involvement means that: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected.

In sum, environmental justice is the goal to be achieved for all communities and persons across this Nation. Environmental justice is achieved when everyone, regardless of race, culture, or income, enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work ***(Comment No. 196407-051)***

Response To: Comment 196407-051

The term "Environmental Justice" is not defined in Executive Order 12898. However, it does state that: "To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands."

The Order goes on to say "each Federal agency shall develop an agency-wide environmental justice strategy ….that

identifies and addresses disproportionately high and adverse human health or environmental effects of its programs, policies, or activities on minority populations and low-income populations. The environmental justice strategy shall list programs, policies, planning and public participation practices, enforcement and/or rulemakings related to human health or the environment that should be revised to, at a minimum: (1) promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations; (2) ensure greater public participation; (3) improve research and data collection relating to the health of and environment of minority populations and low-income populations; and (4) identify differential patterns of consumption of natural resources among minority populations and low-income populations. In addition, the environmental justice strategy shall include, where appropriate, a timetable for undertaking identified revisions and consideration of economic and social implications of the revisions."

The Order also describes research and data collection activities that can be undertaken to ensure that the health of minority and low-income populations is protected, and to understand the risks associated with consuming subsistence foods.

The BLM works closely with closely with the tribal governments on the North Slope in the decision-making process to ensure that management plans adequately consider subsistence and other concerns of Native peoples. In addition, the BLM works closely with several research and advisory groups that develop and implement science strategy on the North Slope. These activities are described in detail in Section 1.10, Interrelationships and Coordination with Other Agencies.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-85, Environmental Justice: the environmental justice analysis is insufficient, and fails to consider significant potential impacts on the North Slope Inupiat population. A new performance-based approach to mitigation would be adopted under Alternatives B and C. The degree to which the numerous, vague, and easily-triggered exception clauses contained in the proposed stipulations and ROPs would prioritize economic and technological concerns over potential impacts to subsistence, sociocultural systems, the environment, and wildlife resources must be fully examined in the environmental justice analysis. The document must analyze all potential impacts that may be allowed to occur if exceptions to mitigation measures are granted. ***(Comment No. 196407-085)***

Response To: Comment 196407-085

Potential impacts to the North Slope Inupiat population are considered in the sections on Environmental Justice, but also in other sections, including birds and mammals, cultural resources, subsistence, and sociocultural systems. Exception clauses apply to all alternatives evaluated in the Draft Amended IAP/EIS. If exceptions are granted, their impacts would be evaluated in detail during project-specific analysis. Before an exception can be granted, the BLM Authorized Officer must consult with federal, state, and local agencies. Mitigation measures, if needed, would be developed at this time to minimize impacts to environmental and social resources.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The conclusions under Alternative C that effects could be "approximately 5 times greater" than under the No Action Alternative, and "20% greater than the Preferred Alternative" in magnitude and extent, make little sense without further explanation. It is simply wrong to conclude that because the amount of oil exploration and development activity could be up to 5 times higher under Alternative C than under Alternative A, that effects on any particular resource will be correspondingly 5 times greater. More important in assessing the potential for impacts than the simple volume of development are the timing, location, and design of facility construction and operation. ***(Comment No. 196407-086)***

Response To: Comment 196407-086

See response to comment 196407-085 under Environmental Justice

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

As BLM itself has pointed out, and as discussed elsewhere in these comments, the reliability of these mitigation measures has yet to be established. Therefore, BLM cannot be assured of meeting its responsibilities regarding environmental justice anymore than it can be assured of meeting its planning responsibilities under FLPMA and ANILCA with respect to current leasing in the Northeast NPRA. Opening the additional areas of the Northeast NPRA that BLM would propose for leasing under Alternatives B or C of the DEIS would seriously exacerbate already severe environmental justice issues by subjecting the most sensitive subsistence resource use areas to the adverse effects of oil and gas leasing. Such an action by BLM would represent blatant disregard for the principles of environmental justice. ***(Comment No.* 197605-051)**

Response To: Comment 197605-051

BLM acknowledges that potential impacts from Oil and Gas activities/development will most directly affect the North Slope communities and have discussed those impacts in various sections of Chapter 4, as well as the ANILCA 810 analysis in Appendix B.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

EPA commends the BLM for conducting public scoping meetings and hearings in North Slope communities using an Inupiat translator. However, we are not aware that the Draft EIS, or a summary of the Drat EIS, was translated into Inupiat for the affected communities to use. The Final EIS should document any written materials that have been provided in the Inupiat language and the distribution that was used to inform residents and solicit comments and input. If an offer to translate written materials was presented to the communities and declined, that information should also be included in the Final EIS. ***(Comment No.* 197632-034)**

Response To: Comment 197632-034

The BLM did not translate the DEIS into Inupiat. We will provide a translated summary of the FEIS in Inupiat upon request by Inupiat community.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

The Draft EIS lacks an adequate summary of the verbal and written comments that were provided to the BLM from the local affected communities during scoping for the project, how the comments were heard and how they were incorporated into the development of the Alternatives. EPA recommends that the Public Scoping Report for the Amendment to the National Petroleum Reserve Alaska Integrated Activity Plan/Environmental Impact Statement (ENSR,2004), which is currently only available on the EIS project web site, be included in its entirety as an appendix in the Final EIS. ***(Comment No.* 197632-035)**

Response To: Comment 197632-035

Chapter 5 identifies consultation and coordination activities that were conducted in support the Draft Amended IAP/EIS. In addition to scoping meetings, additional meetings were held in Anchorage and on the North Slope to identify issues and concerns that should be considered when developing the alternatives. In addition, comments from the affected communities on the Draft Amended IAP/EIS were considered when developing the Final Amended IAP/EIS; specific responses to these comments are given in this Appendix. A more complete discussion of the alternatives development process is provided in Appendix L, Comments and Responses. The Public Scoping Summary Report for the Amendment to the Northeast National Petroleum Reserve – Alaska Integrated Activity Plan/Environmental Impact Statement has been included in its entirety on the CD located in the back pocket of the Final Amended IAP/EIS. It is also available on the project website at http://nenpra.ensr.com.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

We also recommend that the Final EIS describes how comments received from residents in affected communities were evaluated and used for decision during the EIS process. We recommend that the Final EIS highlight or footnote components of the Preferred Alternative to show where and how input from residents in affected communities was incorporated. Documentation of such efforts and analysis is needed to determine if federal Environmental Justice requirements have been met. ***(Comment No. 197632-036)***

Response To: Comment 197632-036

See response to comment 197632-035 under Environmental Justice

TOPIC: FISH

Comment From: Michael R. North (Comment Letter No. 196264)

Page 3-33. I have found that tapped lakes are largely devoid of fish (see my 1986 Master's thesis, which you reference regarding yellow-billed loons). References here to the contrary should be cited. I would like to know who derived these results, what time of year they sampled, and what methodology they used. Any events that convert non-tapped lakes to tapped lakes would result in significant impacts to waterbird habitat and fish habitat. ***(Comment No. 196264-012)***

Response To: Comment 196264-012

Moulton 1996 a and b (both cited in the draft EIS) both report catching numerous species of fish in tapped lakes. Space considerations for the DEIS required that decisions about the detail for these areas be condensed, but the appropriate references are included.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The Borough's Department of Wildlife Management has been involved in studies of broad whitefish since 1988, conducting research and gathering traditional knowledge from local fishermen about NPR-A. Broad whitefish have a complex and interesting life history. In the NPR-A region they mature at an average of 12 years, live to 40 years old, can achieve 5+ kg, and are excellent eating by any standard (Philo et al., 1993). Broad whitefish migrate considerable distances and use a variety of habitats (Morris, 2003). The central part of the North Slope (including the NPR-A) is more or less the center of concentration for this species in northern Alaska. The broad whitefish requires a number of different habitats throughout its life. These include deep river habitat for spawning and over-wintering, rivers and streams as migration corridors, nearshore brackish habitat for feeding of certain size classes, and lakes for feeding and overwintering. For access to important lake habitat, many use seasonal (ephemeral) streams. Fish may spend just a summer or up to perhaps 10 years in a lake before they leave to spawn (Morris, 2003). ***(Comment No. 196407-029)***

Response To: Comment 196407-029

This is all very interesting and relevant information. Due to space considerations in the DEIS some background material was condensed. In particular descriptions of individual species were shortened considerably. Broad whitefish were included at a level similar to other species treatments in the text.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

In the Northeast Planning Area, the small seasonal creeks feeding the Miguakiak River are very important and must be protected should development occur. The highest catch rates noted in recent studies occurred in these small drainages (NSB unpublished data). Bridging small creeks rather than using culvert pipe can generally achieve

protection of these drainages. While bridging is more expensive, it is necessary to assure the continued abundance of this important subsistence resource. Neither the body of the Draft Amended Plan, nor the specific proposed mitigation measures, adequately addresses or analyzes the bridge versus culvert question or provides assurances that seasonal and ephemeral streams will be appropriately protected. ***(Comment No. 196407-030)***

Response To: Comment 196407-030

Bridging of creeks, rather than using culverts, can help to reduce short-term impacts to creeks, as disturbance of the creekbed is minimal during installation of a bridge. However, bridge installation would impact riparian habitat adjacent to the creek, and bridges often require more maintenance to keep them operative and safe for use. As stated in ROP E-6, bridges, rather than culverts, are the preferred method for crossing rivers, and can also be used for crossing streams. Impacts associated with the use of culverts and bridges is discussed under Water Resources for each alternative. The use of a bridge or culvert to cross a stream will be determined and evaluated in more detail during analysis of specific projects in the Planning Area.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The Amended Draft EIS says that the 1998 NE NPR-A ROD and Alternatives B and C "both prohibit exploratory drilling in rivers and streams . . . and in fish bearing lakes unless the lessee demonstrates, on a site specific basis, that biological impacts would be minimal or there is no other feasible alternative."99 So, the Amended Draft EIS would have the reader believe that there is nothing here to analyze. But nowhere does the 1998 NE NPR-A ROD allow drilling in rivers, streams and lake beds when impacts are minimal or there is no other feasible alternative. Only Alternatives B and C would allow that.100 Under the 1998 NE NPR-A ROD, exploratory drilling is not allowed in any lake (compare with Alternatives B and C which has no restriction on non-fish bearing lakes), river or stream. Exceptions to this prohibition can only be granted for shallow lakes that do not support significant fish or bird populations and that are hydrologically isolated, and only when it is environmentally preferable. An additional impact under Alternatives B and C that is not discussed is that only under the leasing scenario presented in these alternatives would exploratory drilling be allowed in Teshekpuk Lake. These are very different mitigation measures and circumstances and they need to be analyzed as such, along with their impacts. ***(Comment No. 197616-106)***

Response To: Comment 197616-106

The comment states that "the Amended Draft EIS would have the reader believe that there is nothing to analyze here". To the contrary, the fact that both Alternatives B and C "prohibit exploratory drilling in rivers and streams and fish bearing lakes unless the lessee demonstrates, on a project-specific basis, that biological impacts would be minimal or there is no other feasible alternative" explicitly implies that the biological sensitivity and importance of such water bodies must be investigated if they are not already known. It is the responsibility of the AO to prevent or minimize to an acceptable level the potential impacts of exploratory drilling on a project-specific basis. Such decisions will not be made in a vacuum, but instead will be conducted with input from Federal, Sate, and NSB regulatory and research agencies and all other interested parties. Predicting the effect of project-specific operations requires some knowledge of time, place, and extent of the operations. Only then can project-specific impact analysis be addressed.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The next subsection in the Amended Draft EIS, discussing the effects of gravel mine sites on fish, also fails to acknowledge the lower level of protection offered by Alternatives B and C. That sections says that both the 1998 NE NPR-A ROD and Alternative B and C are intended to "minimize the effects of gravel mining on fish by limiting gravel mine sites within the active floodplain of any river, stream, or lake unless the action enhances fish habitat."101 That might be the intent, but the 1998 NE NPR-A ROD is more likely to achieve that intent since under the current management plan gravel mine sites within active flood plains are prohibited unless there is no feasible or prudent alternative or the location of the gravel mine in the flood plain enhances fish habitat. Compare this with Alternative B and C which only requires that the AO "consider . . . [l]ocations outside the active flood plain" and "[p]otential use of the site for enhancing fish and wildlife."102 The level of protection to fish in Alternative B and C is clearly less than the level of protection in the 1998 NE NPR-A ROD, but the Amended Draft EIS incorrectly says that they provide an

equivalent level of protection. ***(Comment No. 197616-107)***

Response To: Comment 197616-107

"Gravel mine sites will be restricted...with minimal environmental damage.... Gravel mine sites are prohibited within the active floodplain of a river, stream, or lake unless the AO, in consultation with appropriate Federal, State, and NSB regulatory and resource agencies, determines that there is no feasible and prudent alternative... Specific sites do not have iron clad protection under existing regulations. It is up to the judgment of the AO et al. under the mandate of providing maximum protect within all bounds of reason

The same mandate for minimizing potential impacts from gravel mining exists under Alternatives B, C, and final Alternative D. Within that mandate, the AO is specifically required to A) consider locations outside the active floodplain (same as under existing management plan when considering "prudent and feasible alternatives"); B) take into account the design and construction of gravel mine sites within the active floodplain to serve as water reserves for future use (same as existing management plan); and C) consider potential use of site for enhancing fish and wildlife habitat (same as existing management plan).

The comment appears to assume that the judgment of the AO, Federal, State, and NSB regulatory and resource agencies, and interested parties will somehow be less circumspect under Alternatives B, C, or D than it is under the current system.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

With regards to the buffer zones around water bodies, the Amended Draft EIS says "[s]ince the only difference between the two alternatives is the size of the buffer zone around water bodies that do not contain fish, both alternatives would afford similar protection to fish and fish habitat."104 But, this is not the only difference between the 1998 NE NPR-A ROD and Alternatives B and C. Alternatives B and C would allow permanent oil and gas facilities closer to fish bearing lakes than the 1998 NE NPR-A ROD if the lessee can demonstrate that impacts to fish would be minimal. A prospective showing that such impact should be minimal is not at all the same thing as those impacts turning out, in fact to be minimal. The protection afforded by the two alternatives is not similar, since only under Alternatives B and C are facilities located closer than 500 feet from a fish bearing waterbody and the associated "minimal impacts" allowed. ***(Comment No. 197616-108)***

Response To: Comment 197616-108

Under current management practices, Stipulation 41 prohibits the construction of all permanent facilities within 500 feet of any active floodplain, unless otherwise permitted by the AO (special habitat zones identified in the EIS have their own designated restrictions). Alternatives B and C have the same provisions for special consideration by the AO if the lessee can demonstrate that impacts to fish would be minimal. Exceptions are possible under all cases at the

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

We have found few instances where the Amended Draft EIS accurately identifies differences between the mitigation measures in the 1998 NE NPR-A ROD and Alternatives B and C. We noticed that the differences in the mitigation measures controlling the amount of water that can be withdrawn from lakes are identified in the Amended Draft EIS. The 1998 NE NPR-A ROD allows the withdrawal of from lakes that are less than 7 feet deep that "lack connection to or are not subject to seasonal flooding by a fish bearing stream."108 Compare this with Alternatives B and C. These would allow unlimited water withdrawals from lakes less than 5 feet deep regardless of whether the lake is connected to fish habitat.109 The Amended Draft EIS reaches the conclusion that the despite the differences, the impacts to fish are the same because lakes that are less than 6 feet deep as some times of the year freeze to the bottom.110 What about the biological benefits to fish in the lakes that are hydrologically connected to lakes that are less than 5 feet deep. The withdrawal of unlimited water from such lakes is not permitted in the 1998 NE NPR-A ROD. This makes sense because, logically, unlimited withdrawal from hydrologically connected shallow lakes is going to change water flow characteristics in other, fish-bearing lakes, which could interfere with fish migration and habitat in the lakes that

do contain such fish, not only during periods of migration, but at other times.111 But all the Amended Draft EIS does is conclude - without analysis - that unlimited withdrawal from five feet deep lakes does not have biological impacts.112 Until there is analysis supporting this conclusion, no one can tell whether the impacts on fish under the different mitigation measures will be the same. **(Comment No. 197616-110)**

Response To: Comment 197616-110

The provisions for water withdrawal pertain to winter and not the open-water /migratory season. As such, each water body is viewed as a self-contained entity. Water withdrawal is limited to protect overwintering fish and habitat. For water bodies less than five feet deep, which freeze entirely during the winter, the issue is moot since fish would not survive anyway.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Our March 8, 2004 comments on the Alpine Satellite Development Plan draft Environmental Impact Statement detail additional concerns about fish. Those comments are hereinafter incorporated by this reference. **(Comment No. 197617-112)**

Response To: Comment 197617-112

Please refer to responses provided in the Alpine Document.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 3, Affected Environment, Section 3.2.9.1, Surface Water Resources, Shallow Lakes and Ponds, Page 3-22. Shallow lakes less than six feet deep also provide important summer rearing habitat for fish if they have a channel connecting them to a stream or deep lake that supports fish overwintering. **(Comment No. 197620-050)**

Response To: Comment 197620-050

Changed text to read: "While ponds and shallow lakes generally lack fish because they usually freeze solid, they can provide important summer rearing fish habitat if they have a channel connecting them to a stream or deep lake that that supports overwintering fish. They also provide important habitat to emergent vegetation, invertebrates, and migratory birds due to the earlier availability of ice-free areas."

TOPIC: FISH

ISSUE: SEALS

Comment From: Thomas Itta (Comment Letter No. 197979)

Thomas Itta, for the record. A resident of Atqasuk. And he's concerned on fish inlkes and rivers over wintering areas and seismic. Sometime ago they had been involved with the working with seismics before and it has devastated known wintering area near here and Ikpikpuk. And these were these are dynamite things and they know that this does kill and devastates fishes, stocks of fish, many of them and many know over wintering areas. And he's and perhaps on account of those that the setbacks, maybe that may be warranted to be even a little bit more to rather than relaxing them in all the ravines, including rivers. **(Comment No. 197979-027)**

Response To: Comment 197979-027

Impacts of seismic on fish are discussed in the EIS. The size of the setbacks were determined by BLM to be appropriate for protection of the resources.

TOPIC: GENERAL COMMENTS AND PROCESS

Comment From: Richard Rossiter (Comment Letter No. 024226)

I was one of the team who explored this area. I was the pilot bringing everyone into and out of the very same area you are talking about. Please do not give them permission to go back. There was NOTHING there!!! I saw it with my own two eyes. No oil. No gas. I was on the USGS team. I've been all around the entire Lake Teshekpuk area. Nothing, absolutely nothing there. The entire team agreed there was nothing there, from the head geologist on down. ***(Comment No. 024226-001)***

Response To: Comment 024226-001

As discussed in Section 3.2.5, Petroleum Resources, of the 17 exploration well and 1 sidetrack well drilled in the Planning Area, at least 7 of those wells have encountered oil or gas and condensate. Delineation of reservoirs in the Alpine field has resulted in the proposal to build satellite fields within the Petroleum Reserve. Based on analysis of geologic formations, seismic data, and exploratory wells, an estimated 2.5 billion barrels of oil are predicted to be economically recoverable in the Planning Area at an average oil price of $30/bbl. Also see response to Comment No. 196952-001, Geology.

Comment From: Kristi Espinoza (Comment Letter No. 118849)

Horrifically, the current plan, which concerns the northeast area of Alaska's National Petroleum Reserve, proposes to open 96 percent of the area to oil & gas development. In addition, it would virtually demolish protections for critical wildlife habitat of Teshekpuk Lake, reducing these scientifically supported protections by 75 percent. Not only does this make NO sense and serve only special interests, it is not even supported by public opinion. Also, this is a complete, blatant reversal of Bureau of Land Management's (BLM) 1998 plan, in which 87 percent of the planning area is open to leasing and 600,000 acres are off limits around Teshekpuk Lake to protect important habitat and subsistence use for caribou and waterfowl. The 1998 plan followed science and American values; this new proposal does not. ***(Comment No. 118849-002)***

Response To: Comment 118849-002

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Steve Yates (Comment Letter No. 121623)

I feel that both extremes are important, the need to provide an independent source of energy, as well as the requirement to protect the environment. I do believe that with the right compromises and concessions, the oil companies can be allowed to bring the wealth of energy to market without damage to the environment. I have been to Alaska and seen the existing pipeline. Seeing this and realizing that it is relatively old technology, I believe that it is possible to develop the area without harming the environment and the wildlife that may be there. I therefore urge you to consider both sides and allow opening up the reserve, but putting serious constraints on the design, construction and operation of this. ***(Comment No. 121623-002)***

Response To: Comment 121623-002

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Sharon Wyberg (Comment Letter No. 186677)

There is no data to show that these areas, which rightly are CLOSED under the existing leasing plan, can be safely opened. Where is there any scientifically based evidence that these areas can be opened safely? There is none! Your

proposal would jeopardize a globally significant ecological resource. For that reason it is not logical and it does not meet the stewardship responsibilities that the Interior Department must operate under. Adequate study and research supporting the political conclusions you desire must be in place before a Plan like this can legally and ethically take effect. ***(Comment No.* 186677-009)**

Response To: Comment 186677-009

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Robert Davison (Comment Letter No. 194259)

The 1998 Environmental Impact Statement and decision by the BLM made 87 percent of the 4.6 million-acre northeast planning area available to oil and gas leasing, but designated 857,859 acres of sensitive tundra and wetland habitats around Teshekpuk Lake for protection. Nearly 600,000 acres of this Teshekpuk Lake Surface Protection Area was closed to oil and gas leasing to safeguard caribou, geese and other wildlife resources. In our judgment, this decision maintains an appropriate balance between oil and gas development and protection of wildlife and their habitats in the northeast portion of the NPR-A. ***(Comment No.* 194259-002)**

Response To: Comment 194259-002

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Mary Hogan (Comment Letter No. 194604)

I was part of an inter-agency team that drafted the first plan which led to leasing closures by Interior Secretary James Watt in 1983. That plan involved a lot of give and take as members struggled with the need to meet energy mandates and the need to protect valuable wildlife habitats. Ironically, that plan contained far more protection for habitat in the area around Teshekpuk Lake at a time when black brant numbers had not started an alarming decline, spectacled eiders were not yet listed as threatened under the Endangered Species Act, and yellow- billed loons, king eider, long-tailed ducks, buff-breasted sandpipers, and dunlin numbers were not creating red flags to managers. The energy needs of the U.S. at that time were perceived as critical and were known as the "energy crisis" but still BLM and the Interior Department saw fit to protect one of the most import wetland complexes in the Arctic in the northeast NPR-A. ***(Comment No.* 194604-003)**

Response To: Comment 194604-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

With respect to the extent to which key decisions appear already to have been made by BLM, on the one hand, a No Action Alternative is presented that would appear to leave the existing management structure in place. That would include the 79 prescriptive lease stipulations and area closures. On the other hand, however, the BLM's project website states that the agency "will reformat current prescriptive stipulations...into a mixture of prescriptive and performance-based stipulations..." The site also claims that the BLM has not made any decision to "change the meaning or intent of any Northeast National Petroleum Reserve-Alaska stipulations." Taken together, the statements would seem to presuppose that a conversion in structure would not result in any change in potential impacts to resources or uses. That conclusion simply cannot be reached without substantial analysis lacking in the Draft Plan. ***(Comment No.* 196407-021)**

Response To: Comment 196407-021

The BLM has not made any decision to change the current prescriptive-based stipulations and ROPs in the Northeast

National Petroleum Reserve-Alaska (Petroleum Reserve) to performance-based measures. In consideration of recent operational experiences in the National Petroleum Reserve and the analysis of the performance-based measures in the Northwest Petroleum Reserve IAP/EIS, BLM believes it is an appropriate time to reconsider the stipulations and ROPs in the National Petroleum Reserve-Alaska and has made a decision to study and consider such a change via this NEPA process. The purpose of the NEPA process is to provide opportunity for public input and ensure informed decision making. Under NEPA, a decision cannot be made until at least 30 days after the release of the Final IAP/EIS. At that time or later, any decisions made on the proposed amendments would be documented in a published Record of Decision. The potential impacts of oil and gas activities under performance-based mitigation measures are evaluated under Alternatives B (Preferred Alternative) and C. The BLM has considered your comments in developing the Final Preferred Alternative.

Comment From: Conoco Phillips (Comment Letter No. 196557)

When the ROD was issued for the 1998 EIS, subsurface geologic data were not available to the BLM when considering the possibility of setbacks in this area. Since the ROD, CPAI has conducted multiple years of exploration drilling that has enhanced our (and the BLM's) understanding of the subsurface structures. This new information has led us to the conclusion that attaining economic viability for a development outside the existing buffer zone is not possible. This information, combined with the fact that the 3-mile setback had no scientific or traditional knowledge basis (i.e. the original suggestion from Kuukpik Corporation was 1.5 miles) serves to support our contention that the current setback is unreasonable and ultimately not economic (for development) based on current knowledge. CPAI believes that the resource can be developed in an environmentally responsible manner with consultation from local, federal and State resource agencies. ***(Comment No.* 196557-068)**

Response To: Comment 196557-068

Both the existing stipulations and the performance-based stipulations under consideration provide lessees with the ability to develop within the setback provided that specific conditions are met.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

The Congress has directed the Secretary of the Interior and the Bureau of Land Management to manage the nation's public lands in accordance with existing federal law, with specific reference to the protection and preservation of subsistence uses on public lands and to federal laws relating to migratory birds and endangered or threatened species, and pursuant to specific policy directives. BLM's failure to adopt Alternative A at this time would violate these laws and policies. Furthermore, the analysis set forth in the current DEIS makes it clear that continued leasing, exploration, development, and production activity under the existing Northeast NPRA IAPIEIS will place the Secretary and the BLM in violation of Federal law and policy unless additional mitigation measures to protect wildlife and subsistence hunting are developed.

A. Failure To Adopt Alternative A Would Place the BLM In Violation of Its Statutory Responsibilities Regarding the Management of Public Lands in Alaska.

1. By its own analysis in the current DEIS, BLM has not met the requirements of ANILCA and FLPMA with respect to leasing under the 1998 Northeast NPRA Decision. ***(Comment No.* 197605-027)**

Response To: Comment 197605-027

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

Finally, for purposes of the present determination, it is clear that the information available to BLM for making a decision to increase the area of the Northeast NPRA open to oil and gas leasing is profoundly inadequate. Therefore, the only responsible course for BLM at this time, consistent with federal law, is to defer any decision regarding

increased leasing in the Northeast NPRA until such time as the structure and information necessary to support the decision are in place. ***(Comment No.* 197605-049)**

Response To: Comment 197605-049

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

We are not saying that the management in the 1998 NE NPR-A ROD is written in stone, but we are saying that focusing on the potential recovery of oil will always make surface protections look like prohibitions on petroleum activity. Congress has directed the BLM to provide these environmental protections, and differing amounts of oil in the area doesn't affect those Congressional mandates. ***(Comment No.* 197616-043)**

Response To: Comment 197616-043

This Draft IAP/EIS does not allow the BLM to abrogate its regulatory responsibility to take the action that is deemed necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the National Petroleum Reserve-Alaska, consistent with the requirements of the National Petroleum Reserve Policy Act (43 CFR 2361.1). The BLM believe the level of resource protection developed for this proposed Northeast Plan amendment, is similar to, or even greater than, the level of resource protection developed for the 1998 Northeast Record of Decision.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

We feel very strongly that the 1998 NE NPR-A ROD correctly set aside a large part of Northeast NPR-A in the Teshekpuk Lake area from leasing and surface occupancy. We are opposed to any changes that would provide less protection to this area. But, less surface protection to this critical and sensitive area is exactly what the BLM is trying to push through this NEPA process. ***(Comment No.* 197616-131)**

Response To: Comment 197616-131

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

We see so many problems with the Amended Draft EIS that we believe that, after revisions, it will need to go out to public comment again if the public is to have the required meaningful opportunity to comment on the proposed action. Given the unspoken industry-friendly policy change driving this process and the pre-ordained result, as well as the enormous gaps in analysis and content that we have demonstrated above, the Amended Draft EIS seems more like an exercise in wishful thinking on the BLM's part than the sort of thorough and objective document contemplated by NEPA. We think that it is grossly deficient, incomplete and unresponsive to the concerns previously expressed by the people of Nuiqsut, who are in the unenviable position of being those who will be most affected by the proposed action. ***(Comment No.* 197616-192)**

Response To: Comment 197616-192

The DEIS provided all the necessary information to inform the public and policy makers adequately of the alternatives, issues, resources, and potential impacts.

TOPIC: GENERAL COMMENTS AND PROCESS

ISSUE: FORM LETTER

Comment From: Charles Smith (Comment Letter No. 000040)

Please accept these comments on the proposed amendment to the oil and gas leasing plan for the northeastern National Petroleum Reserve-Alaska. I am especially concerned about the impact of the Bureau of Land Management's proposal on the area around Teshekpuk Lake, which is one of the most unique and important wetlands in the entire circumpolar Arctic. ***(Comment No. 000040-001)***

Response To: Comment 000040-001

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Charles Smith (Comment Letter No. 000040)

I urge you to adopt Alternative A, the No Action Alternative because it maintains protection for the entire Teshekpuk Lake Surface Protection Area. This incredible area provides critical habitat for molting geese from three countries and a vitally important caribou herd that Alaska Natives depend upon for their subsistence. The BLM's proposal to reduce protection in this area to only 213,000 acres -- less than five percent of the planning area -- is completely inadequate for the geese, which scientific evidence shows are highly sensitive to disturbance, and does little to protect the caribou that give birth to their calves in this area. ***(Comment No. 000040-002)***

Response To: Comment 000040-002

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Charles Smith (Comment Letter No. 000040)

Eighty-seven percent of the northeastern Reserve is already open to oil and gas companies for leasing. There is no science indicating that the sensitive areas now closed to leasing can be opened safely. It would be a mistake to risk the internationally significant ecological resources of Teshekpuk Lake for short-term supply of energy, especially when we know that the United States cannot drill its way to energy independence. ***(Comment No. 000040-003)***

Response To: Comment 000040-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Barbara Hoekenga (Comment Letter No. 000119)

Please accept these comments on the proposed amendment to the oil and gas leasing plan for the Northeast National Petroleum Reserve Environmental Impact Statement. I am especially concerned about the impact the Bureau of Land Management's proposal would have on the area around Teshekpuk Lake, one of the most unique and important wetlands in the entire Arctic. ***(Comment No. 000119-001)***

Response To: Comment 000119-001

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Barbara Hoekenga (Comment Letter No. 000119)

I urge you to adopt Alternative A, the "No Action" alternative, because it would maintain protection for the entire Teshekpuk Lake Surface Protection Area. This extraordinary ecosystem provides critical habitat for molting geese and nesting habitat for Steller's eiders, northern pintails, yellow-billed loons and other species. It also supports a vitally important caribou herd that Alaska natives depend on for their subsistence. ***(Comment No. 000119-002)***

Response To: Comment 000119-002

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Barbara Hoekenga (Comment Letter No. 000119)

Eighty-seven percent of the northeastern reserve is already open to oil and gas companies for leasing. In the five years since the original 1998 northeast plan, additional information and analyses have been accumulated that point toward significant impacts on fish and wildlife if more of this sensitive area is opened. It would be a huge mistake to risk the internationally significant ecological resources of Teshekpuk Lake for a short-term supply of energy, especially when we know that the United States cannot drill its way to energy independence. ***(Comment No. 000119-003)***

Response To: Comment 000119-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Linda Muller (Comment Letter No. 033401)

I urge you to adopt Alternative A, the No Action Alternative, for amending the oil and gas leasing plan for the northeastern planning area of the National Petroleum Reserve-Alaska (NPR-A). Only this alternative will protect the northeast planning area's outstanding wildlife, wilderness, and subsistence values for future generations. ***(Comment No. 033401-001)***

Response To: Comment 033401-001

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Linda Muller (Comment Letter No. 033401)

In particular, I support the No Action Alternative because it maintains protection for the entire Teshekpuk Lake Surface Protection Area. Teshekpuk is one of the most unique and important wetlands in the entire circumpolar Arctic. This incredible area provides critical habitat for molting geese from three countries and a vitally important caribou herd that Alaska Natives depend upon for their subsistence. The Bureau of Land Management's proposal to reduce protection in this area to only 213,000 acres -- less than five percent of the planning area -- is completely inadequate for the geese, which scientific evidence shows are highly sensitive to disturbance, and puts at risk the caribou that give birth to their calves in this area. ***(Comment No. 033401-002)***

Response To: Comment 033401-002

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Linda Muller (Comment Letter No. 033401)

There is no science indicating that the sensitive areas now closed to leasing (under the existing oil and gas leasing plan) can be opened safely. Indeed, a recent National Academy of Sciences report found that oil and gas

development in other parts of the North Slope have had widespread damaging impacts on the air, water, landscapes, and wildlife of the region, and on the health of its people. It would be a mistake to risk the internationally significant ecological resources of Teshekpuk Lake for a short-term supply of energy, especially when we know that the United States cannot drill its way to energy independence. ***(Comment No. 033401-003)***

Response To: Comment 033401-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: A.E. White (Comment Letter No. 106114)

I am writing to you today asking you to protect the Teshekpuk Lake and other important wildlife areas in the National Petroleum Reserve in Alaska by going back and offering a new alternative that protects more special fish, wildlife and subsistence hunting areas and includes more protective stipulations. At the very least, the BLM should adopt Alternative A, the "No Action" Alternative. ***(Comment No. 106114-001)***

Response To: Comment 106114-001

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: A.E. White (Comment Letter No. 106114)

The majority of scientific evidence indicates that significant impacts could occur to fish and wildlife if more of this area is opened to oil development. Teshekpuk Lake and its surrounding wetlands is a vital tundra-wetland complex in the circumpolar Arctic that is home to thousands of waterfowl and caribou. Tens of thousands of birds, including brant, greater white-fronted geese, Canada and Snow geese gather in the Teshekpuk wetland system to molt their flight feathers and are thus vulnerable to human disturbances. ***(Comment No. 106114-003)***

Response To: Comment 106114-003

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: A.E. White (Comment Letter No. 106114)

Additionally, coming to nest in this area with few predators are thousands of birds, including the threatened spectacled eider listed under the Endangered Species Act. These species will also suffer from the increased number of predators, such as gulls, ravens and foxes that are attracted to oil fields. ***(Comment No. 106114-004)***

Response To: Comment 106114-004

Some increases in predators are likely around oil and gas facilities. Mitigation measures that would be in place should limit any increase in predators but some impacts to prey species could occur.

Comment From: A.E. White (Comment Letter No. 106114)

Also, the 45,000-animal Teshekpuk Lake Caribou Herd will be threatened by such development. Each year, the herd migrates to the Teshekpuk Lake area to calve and escape from insects. If caribou are forced to move to less desirable habitats, calving numbers could decline, reducing the population and greatly impacting many Alaska Natives who depend on the herd as a subsistence resource. ***(Comment No. 106114-005)***

Response To: Comment 106114-005

The BLM considered this issue when developing the final Preferred Alternative. Under that alternative, No Surface Occupany would be allowed for permanent oil and gas facilities, except pipelines and some community roads, in portions of calving and migration areas used by caribou. Under this alternative, the amount of development that could occur within seven lease blocks north of Teshekpuk Lake would be limited to no more than 300 acres, further reducing potential impacts in this area.

Comment From: A.E. White (Comment Letter No. 106114)

Instead of opening up more of the area to leasing and oil and gas development, the BLM should provide a more balanced, science-based approach to energy development and environmental protection by permanently protecting the Teshekpuk Lake and Colville River Special Areas and strengthening monitoring and lease stipulation requirements. At a very minimum, the BLM should adopt Alternative A, the "No Action" Alternative, which retains current protections for the critical fish and wildlife habitats around Teshekpuk Lake. ***(Comment No.* 106114-006)**

Response To: Comment 106114-006

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Karen Appleby (Comment Letter No. 137605)

I strongly oppose your preferred alternative for amending the oil and gas leasing plan for the northeastern planning area of the National Petroleum Reserve-Alaska (NPR-A). I urge you to select Alternative A, the No Action Alternative, and to prepare a new plan that will strengthen the existing environmental and wildlife protection in the area, especially in the critical and fragile Teshekpuk Lake region. ***(Comment No.* 137605-001)**

Response To: Comment 137605-001

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Karen Appleby (Comment Letter No. 137605)

The risk to wildlife is simply too great, the consequences too likely to be irreversible. The Interior Department's own data, gathered between 1999 and 2003 indicate that on average, 47 percent of the brant and 44 percent of the white-fronted geese now molt on lakes that would be partly or wholly unprotected in your preferred alternative. ***(Comment No.* 137605-002)**

Response To: Comment 137605-002

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Karen Appleby (Comment Letter No. 137605)

Further, the preferred alternative would diminish protection for the caribou by fully 75 percent. Neither of these risks is acceptable and neither is necessary. The Inupiat Eskimo people rely on the 45,000-member herd for subsistence and have done so for 8000 years. ***(Comment No.* 137605-003)**

Response To: Comment 137605-003

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Karen Appleby (Comment Letter No. 137605)

The entire Teshekpuk Lake Surface Protection Area deserves your most careful protection. Yet, your preferred alternative would reduce protection to a scant 213,000 acres, less than five percent of the planning area. That level of protection will not begin to protect the geese, the caribou or the dozens of other species that now find safety there. Available science clearly indicates that geese are highly sensitive to disturbance during the molt. And it shows that caribou that give birth to their young in this area are also at risk from the kind of disturbance your preferred alternative would permit. ***(Comment No. 137605-004)***

Response To: Comment 137605-004

Under the final Preferred Alternative, Goose Molting Areas would have No Surface Occupancy restrictions, and development within seven lease tracts north of Teshekpuk Lake, and important area to nesting and molting waterfowl, would be limited to 300 acres of permanent surface development per lease tract. In addition, Teshekpuk Lake would be deferred from leasing under this alternative.

Comment From: Karen Appleby (Comment Letter No. 137605)

At the same time, there is no science to show that these areas, closed under the existing leasing plan, can be safely opened. Your proposal would jeopardize a globally significant ecological resource. ***(Comment No. 137605-005)***

Response To: Comment 137605-005

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Anna Jacus (Comment Letter No. 183854)

As a citizen who cares about protecting America's Arctic, I would like to submit the following comments on the proposed amendment to the oil and gas leasing plan for the northeast section of the National Petroleum Reserve-Alaska (the Reserve). I strongly believe that, at the very least, you should adopt Alternative A, the no action alternative. Additionally, I believe that you should go beyond Alternative A by providing the essential protections needed to maintain the area's extraordinary wildlife values. ***(Comment No. 183854-001)***

Response To: Comment 183854-001

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Anna Jacus (Comment Letter No. 183854)

Instead of turning more of our nation's wilderness areas over to oil and gas drilling we need to take a hard look at our nation's energy policy overall. While I am not against drilling in the Reserve, I strongly believe that the Northeast Planning Area should be managed to represent a balance of competing extraction and conservation values as was mandated when the Reserve was transferred to the Department of the Interior At a minimum, I urge that BLM retain the current protections in
place for Teshekpuk Lake, from the 1998 Northeast Plan. Ultimately, I request that permanent protections be put in place for the areas of most significant habitat, including the Teshekpuk Lake and the Coleville River Special Areas, to ensure that the area's critical wildlife will be available for generations to come. ***(Comment No. 183854-003)***

Response To: Comment 183854-003

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Christian Timmerman (Comment Letter No. 196988)

This letter is submitted to the Bureau of Land Management as a public comment on the proposed amendment to its oil and gas leasing plan for the northeastern National Petroleum Reserve-Alaska. I am especially concerned about the area around Teshekpuk Lake, which is one of the most unique and important wetlands in the entire circumpolar Arctic. ***(Comment No.* 196988-001)**

Response To: Comment 196988-001

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Christian Timmerman (Comment Letter No. 196988)

I urge you to adopt Alternative A, the No Action Alternative because it maintains protection for the entire Teshekpuk Lake Surface Protection Area. This incredible area provides critical habitat for molting geese from three countries and a vitally important herd of caribou harvested by Alaska Natives living on the North Slope. Scientific evidence shows the geese that gather to molt near Teshekpuk Lake are highly sensitive to disturbance, and BLM's proposal to reduce protection in this area to only 213,000 acres of goose molting habitat north of the lake is completely inadequate. A no-lease zone of only 213,000 acres also does little to protect the caribou that give birth to their calves and require a much larger area for their seasonal movements throughout the Teshekpuk Lake area seeking relief from insects. ***(Comment No.* 196988-002)**

Response To: Comment 196988-002

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Christian Timmerman (Comment Letter No. 196988)

Eighty-seven percent of the northeastern Reserve is already open to oil and gas companies for leasing and about 1.4 million acres are under lease now. Although I do not oppose additional oil and gas development in the Reserve, there is no science indicating that the sensitive areas now closed to leasing can be opened safely. It would be a mistake to risk the internationally significant ecological resources of Teshekpuk Lake for short-term energy supplies, especially when we know that the United States cannot drill its way to energy independence. ***(Comment No.* 196988-003)**

Response To: Comment 196988-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Donald M. Robinson (Comment Letter No. 197210)

I am outraged by your attempts to exploit the Western Arctic region of Alaska for the sole benefit of the oil and gas industry. ***(Comment No.* 197210-001)**

Response To: Comment 197210-001

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Donald M. Robinson (Comment Letter No. 197210)

While I support legitimate needs to recover natural resources, there is a better way. Just as with Alaska's Arctic National Wildlife Refuge, there are biologically critical area in the Western Arctic that must be preserved and deserve permanent protection. The costs here are simply too great, and the benefits far too minimal. ***(Comment No.* 197210-002)**

Response To: Comment 197210-002

See response to comment 197614-007 under Alternatives, Range of Alternatives, Preferred Alternatives

TOPIC: GEOLOGY

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

In Chapter 3, the description of the affected environment, natural seepage of oil and gas in and near the Northeast National Petroleum Reserve - Alaska (NPRA) planning area was not mentioned. Oil seeps are known (and described in the literature) at Umiat and Fish Creek within the planning area and at Cape Simpson, just to the northwest outside of the area. Some gas bubbles are associated with the Umiat oil seep. Considering the large size of the planning area and the relatively small "footprint" of the described natural seepages, it is very likely that there are additional natural hydrocarbon occurrences in this area. ***(Comment No. 196952-001)***

Response To: Comment 196952-001

Information on natural seeps of oil and gas in and near the Planning Area has been added to Section 3.2.5.2 under Past Exploration Efforts.

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 3-7, CHAPTER 3: DESCRIPTION OF THE AFFECTED ENVIRONMENT, Section 3.2.3 Physiography, Subsection 3.2.3.1 Arctic Coastal Plain Province: The Arctic Coastal Plain Province in the planning area is bordered on the north by the Arctic Ocean, but there is no mention of this nor the characteristics of the coastline. ***(Comment No. 196952-003)***

Response To: Comment 196952-003

Added the following text to section 3.2.3.1 Arctic Coastal Plain Province: "The Arctic Coastal Plain (ACP) Province covers approximately 85 percent of the Planning Area; it extends inland from the coast of the Arctic Ocean. The coastline is irregular and contains many small bays, lagoons, spits, beaches, and barrier islands (Committee on Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope 2003)."

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 3-10, CHAPTER 3: DESCRIPTION OF THE AFFECTED ENVIRONMENT, Section 3.2.4 Geology and Minerals, Subsection 3.2.4.2 Minerals; Uranium Potential: The cited reference (Gryc, 1985) for documenting the presence of uranium in the Artic Coastal Plain (ACP) of NPRA is not correct. There is no mention of uranium in that publication. There is a brief report by Hufian (1985) that indicates very low uranium content in the Nanushuk Group rocks exposed at the surface. The citation for that report is below: Huffman, A.C., Jr., 1985, Uranium potential of the Cretaceous Nanushuk Croup, North Slope, Alaska, in Huffman, A.C., Jr., ed., Geology of the Nanushuk Group and related rocks, North Slope, Alaska: U. S. Geological Survey Bulletin 1614, p. 121-123. ***(Comment No. 196952-004)***

Response To: Comment 196952-004

The U.S. Geological Survey's National Uranium Resource Evaluation (NURE) Hydrogeochemical and Stream Sediment Reconnaissance Data show that approximately 4,289 parts per million of uranium sediments were found in the Harrison Bay, Ikpikpuk, Teshekpuk, and Umiat topographic quadrangles during sampling from 1970-1984. New text was added to document and the incorrect reference was removed.

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 3-10, CHAPTER 3: DESCRIPTION OF THE AFFECTED ENVIRONMENT, Section 3.2.4 Geology and Minerals, Subsection 3.2.4.2 Minerals; Coal Resources: The coal resource comments are correct, but references are needed similar to references in all the other mineral categories considered. ***(Comment No. 196952-005)***

Response To: Comment 196952-005

References have been added in Section 3.2.4.2.

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 3-13, CHAPTER 3: DESCRIPTION OF THE AFFECTED ENVIRONMENT, Section 3.2.5 Petroleum Resources, Subsection 3.2.5.2 Petroleum Activities in Northern Alaska; Past Exploration Efforts: In the discussion of the 'new Jurassic play7 revealed by the Alpine discovery, one could also reference the report by Houseknecht (see references) describing the Beaufortian plays that were identified and evaluated in the 2002 USGS assessment of the NPRA. ***(Comment No. 196952-007)***

Response To: Comment 196952-007

Added the reference "Bill Berg - U.S. Geological Survey, Open-File Report 03-040, Online Only, Version 1.0,

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 4-66, Chapter 4 Environmental Consequences, Section 4.3, Alternative A (No Action Alternative), Section 4.3.4 Water Resources, Section 4.3.4.1 Surface Water and Groundwater Resources, first full paragraph, second-to-last sentence: The sentence states that shallow, marshy, ponded, or flooded tundra can reach summer temperatures of 18 degrees Fahrenheit; this seems too low and unlikely, as it is still well below freezing, given that the average temperature in July is reported to be 46 degrees on page 3-5. Perhaps, additional new or reiterated information on the depth of permafrost in this type of environment, including discussion of air/water temperature variability during the summer months, such as daily and monthly ranges, would help clarify the seeming inconsistency. The DEIS cites Miller et al. (1980) in two other places and attributes a different temperature each time the report is cited. On page 4-48 the Miller report (1980) is cited as stating that shallow waters on the tundra can reach 66 degrees (second-to-last paragraph, last sentence), which seems high compared to the reported average July temperature. ***(Comment No. 196952-011)***

Response To: Comment 196952-011

The text on page 4-66 of the Draft Amended IAP/EIS should have stated that shallow water temperatures can reach about 18 degrees Centigrade (C), not Fahrenheit (F). This temperature is equivalent to 64 degrees F. Other references to shallow water temperatures in the Amended IAP/EIS have been corrected. Shallow water exposed to direct sunlight during July would have temperatures that are higher than mean daily temperature, especially on days when the high temperature for the day is above 64 degrees F.

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

On page 4-181 Miller is cited again as stating that the waters can reach 64 degrees (first full paragraph, fourth sentence). In light of these discrepancies, the USGS recommends that the report be given a complete verification review. ***(Comment No. 196952-012)***

Response To: Comment 196952-012

See response to comment 196952-011 under Geology

TOPIC: GLOBAL CLIMATE CHANGE

Comment From: Peter Pennington (Comment Letter No. 000037)

Climate change at a local level is going to affect the area under question. In 1995 the EPA published papers suggesting that the sea level will rise due to global warming by about 12 inches a century. The Department for the Environment, Food and Rural Affairs in London, this June has revised its figures to an increase of about 18 inches per century. Much of the area around Teshekpuk Lake is, I am told, no more than ten feet above sea level. ***(Comment No. 000037-007)***

Response To: Comment 000037-007

Comment noted. As discussed in comment 197618-011, the effects of oil development in the Planning Area, and the use of oil recovered from the Planning Area, would make a very small contribution to global warming.

Comment From: Dominique Bachelet (Comment Letter No. 181423)

My research on climate change impacts on arctic environments shows that high latitude ecosystems are particularly at risk from a warming climate. Although Alaska's temperatures have been above normal for nearly two decades, climate models indicate the average annual temperature for the state may increase by 13 degrees Fahrenheit in the worst-case scenario by the end of the 21st century. Several research papers published this year describe the various impacts that may reduce the extent of the tundra by 90% by 2100. Since 1970 over 15% have already been lost. I urge you not to jeopardize the existence and subsistence of this fragile ecosystem by an unnecessary human disturbance. ***(Comment No. 181423-004)***

Response To: Comment 181423-004

See response to comment 195986-002 under topic Global Warming, and comment 197618-011 under topic Air

Comment From: Brenda Wright (Comment Letter No. 195732)

Global warming is being felt in the arctic environment right now. The additional impact of industrial oil development could have major consequences for Teshekpuk Lake wildlife. Now more than ever before, we need to have areas unaffected by human activity. Climate changes are occurring more rapidly in the arctic than anywhere else. The continued existence of untouched refuges may help increase wildlife and ecosystem adaptability to the many unforeseen changes the future may bring. ***(Comment No. 195732-005)***

Response To: Comment 195732-005

See response to comment 195986-002 under topic Global Warming, and comment 197618-011 under topic Air Quality. The effects of oil and gas exploration and development in the Planning Area and on the North Slope are also discussed in more detail in Section 4.7.9.1, Air Quality Cumulative Analysis.

Comment From: Aaron Wernham (Comment Letter No. 195986)

Climate Change: Absent from the draft EIS is any discussion of the concurrent impact of climate change on this ecosystem. The animals and Alaskan Native populations affected by oil exploration are having to adapt concurrently to rapid warming of the climate. I fear that these two stresses combined may prove overwhelming to many species that depend on this critical and unique environment. The arctic climate has warmed 7 degrees F over the past 30 years, and the duration of the winter season has shortened. ***(Comment No. 195986-002)***

Response To: Comment 195986-002

The effects of climate change on water supply, food security, sea-level fluctuations, and Arctic tundra are addressed in each discipline section. Section 4.6.5.11, Global Climate Change, also discusses potential impacts on the North Slope from global climate change.

Comment From: Aaron Wernham (Comment Letter No. 195986)

Thus, the EIS is incomplete without an assessment of the concurrent impacts of climate change. ***(Comment No.*** **195986-005)**

Response To: Comment 195986-005

See response to comment 195986-002 under Global Warming

Comment From: Steve Zack (Comment Letter No. 196561)

Concerns regarding the changing climate of the arctic are not addressed. The interactive effects of widespread thermokarst, soil erosion, plant changes, and how these issues might affect the coastal plain environs for wildlife was scarcely mentioned. Most critically, changes in sea level would likely dramatically force shifts in animal distributions in low-lying arctic coastal plain areas of the NPR-A. The question is no longer if climate change is occurring, but how and when its affects will become manifest. There is scarce consideration of this huge issue, and its likely strong effects on wildlife and habitats in the arctic coastal plain as they may relate to the environment of the northeast NPR-A. ***(Comment No.*** **196561-011)**

We have revised the text to include more discussion of potential impacts associated with climate change. While it is clear that the climate is changing it is not at all clear what many of the impacts will be and over what period of time they will occur.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The cumulative impacts section of the Amended Draft EIS says that it is predicted that climate change will increase the abundance of deciduous shrubs. Amended Draft EIS p. 4-390. The Amended Draft EIS says that climate change may cause caribou calving areas to shift, but there is no analysis whether global climate change will obliterate preferred calving habitat or what impacts that will have on caribou calving. ***(Comment No.*** **197616-144)**

Response To: Comment 197616-144

It is very unlikely that climate change will obliterate preferred caribou calving habitat though it may cause shifts in proffered habitat. These potential changes are difficult to predict with certainty and are likely to occur over an extended period of time as colonization rates and success ional changes in plant communities on the north slope may take 10's to 100's of years to shift a plant community to the extent that would cause caribou to shift a significant distance.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Assumptions regarding oil field development should be realistic, complete and supported by documentation. An impact analysis should include but not be limited to the following:

• An analysis of the effect on global warming and climate change. Scientific evidence indicates North Slope oil fields are a significant source of greenhouse gases. An analysis of the effect of global warming on oil field exploration and development facilities and assumptions about ice roads and other technology. ***(Comment No.*** **197617-055)**

Response To: Comment 197617-055

Comment noted, see responses to comments 197617-065 and 197617-066 under topic Global Warming.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Global Warming The Amended IAP/EIS discussion of the impacts from climate change at 4.6.5.11 is inaccurate and incomplete. First, the discussion starts off by inaccurately identifying CO (carbon monoxide) as a principal greenhouse gas, but does not mention CO2 (carbon dioxide). Second, the discussion is so generalized as to be meaningless. While it identifies the general categories of impacts from climate change, e.g., sea-level fluctuation, effects on Arctic tundra, it does not even take a stab at theorizing how these will affect the specific resources in Planning Area, the entire Reserve, or the Arctic Coastal Plain. This failure stands in stark contrast to the full paragraph the subsection devotes to the adverse affects on the oil and gas industry's operations on the North Slope from climate change. Id. at 4-360. Though incomplete, this paragraph about the problems confronting industry from climate change illustrate the need for BLM to do the same for the natural resources it is obligated to manage and protect. The subsection also asserts that: Because climate change must be viewed from a global perspective, the magnitude of the emissions potentially contributed by oil and gas activities in the Planning Area needs to be viewed in that context. Activities associated with exploration, development, and production of oil and gas resources from the Planning Area will produce some of the listed greenhouse gases, primarily as a result of power requirements and fuel consumption, activities that produce CO2. The incremental contribution of greenhouse gases from the proposed alternatives in the Planning Area would be negligible when compared to total greenhouse gas contributions. Id. at 4-360. ***(Comment No.* 197617-065)**

Response To: Comment 197617-065

The text in Section 4.6.5.11 has been corrected to note that CO2 is the principal greenhouse gas. Effects of Climate Change on specific resources other than Air Quality within the Planning Area, the entire National Petroleum Reserve-Alaska, and the Arctic Coastal Plain would be speculative. The EIS air quality material does discuss the effects of climate change on water supply, food security, sea-level fluctuations, and Arctic tundra. Additional information from the NRC (2003) report on the influence of climate change on future oil and gas development has been included in Section 4.6.5.11.

Comment From: Environmental Coalition (Comment Letter No. 197617)

This quotation again demonstrates BLM's failure to provide site-specific data and information in the draft Amended IAP/EIS. The statements do not put the contributions of greenhouse gas emissions in any properly scaled context. Negligible when compared to what? Total greenhouse gas contributions from all activities across the North Slope? Within the Reserve? And what are quantities of the "total greenhouse gas" emissions BLM is comparing? And do they take into account only the emissions occurring during the exploration and production of oil and gas, or do they include emissions occurring when the oil and gas are refined for market, transported and then consumed? These questions need to addressed and resolved in any final EIS if for no other reason than without an accurate assessment of the quantities of greenhouse gases involved and an identification of their sources, BLM cannot prepare and include in the EIS an adequate discussion of mitigation measures needed to address greenhouse gases and their impacts. NEPA requires that there be such a mitigation discussion in every EIS. ***(Comment No.* 197617-066)**

Response To: Comment 197617-066

Additional information was added to Section 4.6.5.11 to better quantify greenhouse emissions from the National Petroleum Reserve – Alaska and the North Slope in relation to global emissions.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Due to global warming, the ice cover of the Arctic has been shrinking at a rate of 3% per decade. The NRC warns that

this "loss of sea ice would reduce critical habitat for marine mammals and seabirds that use ice shelves and flows as platforms for feeding, resting, reproducing, and molting." NRC Report at 92. The NRC has concluded that "climate warming at predicted rates in the Beaufort Sea region is likely to have serious consequences for ringed seals and polar bears, and those effects will accumulate with the effects of oil and gas activities in the region." NRC Report at 169. The draft Amended IAP/EIS should have discussed the additional impacts to ice dependent species from oil and gas development in the context of impacts from global warming. ***(Comment No.* 197617-067)**

Response To: Comment 197617-067

The IAP/EIS discusses these points on Page 4-393 "Effects of Global Warming" as part of the cumulative analysis on marine mammals.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Global warming could also have a serious impact on subsistence, beyond the population level effect it could have on various species. According to the NRC, "if migrations of bowhead whales (Balaena mysticetus), for example, were to shift farther offshore and if populations of seals near the coast were to be seriously reduced, the consequences for coastal human subsistence cultures could be dramatic." NRC Report at 92. The effect of distribution of subsistence species altered by offshore activities combined with the effects of global warming on subsistence need to be discussed in the cumulative impacts analysis. ***(Comment No.* 197617-068)**

Response To: Comment 197617-068

The effects of global warming on subsistence resources have been discussed in the cumulative impact analysis. Please see Chapter 4, Section 4.6 for a complete discussion on the Effects of the Cumulative Case.

Comment From: Susanne C. Moser (Comment Letter No. 197621)

Against this backdrop, I am greatly concerned by any action that (a) makes ecosystems already greatly at risk from climate warming even more vulnerable, and (b) adds more to the cause of anthropogenic climate change. ***(Comment No.* 197621-002)**

Response To: Comment 197621-002

Comment noted, see responses to comments 197617-065 and 197617-066 under topic Global Warming.

Comment From: Kristen Cummings (Comment Letter No. 197977)

At this year's annual meeting in March, these 47 autonomous affiliate groups came together to pass a resolution calling for a balanced approach to the management of the natural resources of America's Arctic. Specifically, the resolution affirmed the Federation's belief that the reserve should be managed to protect the maximum protection of areas with significant wildlife and subsistence values, as was mandated when the reserve was transferred to the Department of the Interior in 1976. Specifically in the Northeast planning area, NWF has called for the permanent protection of existing special areas, including the Teshekpuk Lake special area, protection for which has been reduced by 75 percent under the preferred alternative in this DEIS. Teshekpuk Lake is an ecological wonderland of both national and international biological and cultural significance. This area has been protected since 1976, recognized by scientists in past administrations as one of the most important wetland complexes in the circumpolar Arctic, providing nesting and molting habitat for untold number of waterfowl, shore birds, and loons, as well as calving grounds for the 45,000-animal Teshekpuk Lake caribou herd. Since the release of the 1998 Northeast plan, there has been an abundance of new information gathered concerning the negative cumulative effects of oil and gas development on Alaska's North Slope, including the administration's own National Academy of Science March 2003 report. In light of this information, any decision to weaken environmental protections and eliminate protected areas in the Northeast planning area would seem to fly in the face of the management priorities that were put in place by

Congress to ensure a balance between energy development and conservation of important wildlife. ***(Comment No. 197977-049)***

Response To: Comment 197977-049

What constitutes appropriate protection to protect significant surface resources within the Petroleum Reserve must be consistent with the purposes of the Act and is at the discretion of the Secretary of the Interior. Section 104 (b) of The Naval Petroleum Reserves Production Act (NPRPA) referring to special areas says: "Any exploration within the Utukok River, the Teshekpuk Lake areas, and other areas designated by the Secretary of the Interior containing any significant subsistence, recreational, fish and wildlife, or historical or scenic value, shall be conducted in a manner which will assure maximum protection of such surface values to the extent consistent with the requirements of this Act for the exploration of the reserve" (emphasis added). Only exploration, not development, was specified in Sec. 104(b) because Section 104 (a) of the NPRPA expressly prohibited production and development leading to production of petroleum. It was Public Law 94 – 514 (December 12, 1980) that directed the Secretary to conduct an expeditious program of competitive leasing of oil and gas in the Petroleum Reserve. In so doing, PL 94 – 514 said activities undertaken pursuant to this Act shall include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on surface resources of the National Petroleum Reserve in Alaska . . ." emphasis added.

TOPIC: GOVERNMENT TO GOVERNMENT

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

The current DEIS Alternatives B and C would overturn vital components of the agreement between our communities and the BLM, upon which the 1998 Decision rests, especially with respect to critical wildlife habitat. If it were to adopt this alternative, BLM would commit a devastating breach of trust with our communities before the stakeholders have had the opportunity to begin to implement the 1998 mitigation measures, thus dooming these critical measures to certain failure before they are even tested. Under this scenario, BLM will have little hope of meeting its congressional directive to accomplish "multiple use" in the NPRA. Thus, having fulfilled its Executive directive to consider additional leasing in NPRA, the rational determination for BLM to make is that, at this time, additional leasing in the Northeast NPRA is not within the scope of BLM's statutory authority. ***(Comment No. 197605-019)***

Response To: Comment 197605-019

BLM does have the authority to allow additional leasing in the Petroleum Reserve; Public Law 94 – 514 (December 12, 1980) directed the Secretary to conduct an expeditious program of competitive leasing of oil and gas in the Petroleum Reserve (42 USC 6508). Also, as stated in Chapter One - 1.3.1., Purpose and Need, the President's

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

The Draft EIS (Section 5.5) documents the government-to-government consultation tasks the BLM completed during scoping and Draft EIS preparation. EPA recommends that additional information be included in the Final EIS to describe the: Level of Tribal participation that was accomplished during government-to-government consultation; Effectiveness of using meetings to achieve the consultation goal of strengthening the BLM's relationship with Tribes; Effectiveness of using the Subsistence Advisory Panel (SAP) in meeting consultation goals for this Draft EIS, i.e., effectiveness of using the SAP as a forum for distributing and discussing issues of importance to Tribes on timely basis; and Process the BLM undertook to evaluate and respond to concerns and recommendations that were submitted to the BLM during government-to-government consultation or s a result of such consultation. ***(Comment No. 197632-038)***

Response To: Comment 197632-038

BLM does not believe that this proposed plan amendment IAP/EIS is the appropriate mechanism to assess the

effectiveness of our consultation methods or procedures. Our consultation with the North Slope Communities is an ongoing process and one that continues to develop through time and efforts of both this agency and the communities of the North Slope. We also believe that the effectiveness of the Subsistence Advisory Panel in meeting consultation goals for this amendment as well as other documents that are developed for management use on the North Slope is evident in the discussions in Chapter 5 of the final document.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

EPA also recommends that the Final EIS highlight or footnote those components of the Preferred Alternative that directly respond to comments, issues, and concerns expressed by Tribes during consultation and that resulted form consensus among Tribes and the BLM. For example, the Final EIS should indicate how the BLM has responded to the specific recommendation from Tribal leaders that the BLM and the Draft EIS adequately address the health impacts of oil and gas leasing on the residents of the North Slope (Section 5.5). We also recommend that the Final EIS highlight or footnote components of the Preferred Alternative that were results of consensus reached between Tribes and the BLM. ***(Comment No.* 197632-039)**

Response To: Comment 197632-039

The BLM considered your comments during the development of the Final IAP/EIS.

TOPIC: GRAVEL, GRAVEL MINES, GRAVEL MINE RECLAMATION

Comment From: Environmental Coalition (Comment Letter No. 197617)

Development - Gravel requirements. The draft IAP/EIS fails to show sites of any potential gravel sources that may be developed in the Northeast Planning Area; therefore the potential effects cannot be analyzed (draft IAP/EIS at 4-60 and 4-451). BLM claims that deposits with suitable quantities of mineral materials (sand and gravel) have not been identified in the Planning Area. Yet, gravel use is essential for any oil field development, and the effects of gravel mining can permanently alter the nature of the habitat in river floodplains. Furthermore in the Alpine Satellite Development Plan Draft Environmental Impact Statement (January 2004) ConocoPhillips relies on the Clover site within the Northeast Planning Area as a source of sand and gravel. These two draft EIS' are obviously not in harmony on this issue and that fact demonstrates that BLM's draft IAP/EIS was not issued after careful and searching analysis of all potential environmental effects. ***(Comment No.* 197617-048)**

Response To: Comment 197617-048

The EIS provides information on the potential impacts of gravel mines on numerous resources. Project-specific analysis of impacts from gravel mining would be conducted after specific gravel extraction sites are discovered and proposed for use and prior to permitting of any mining. The EIS has been modified to acknowledge that gravel may be extracted from the Clover site.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Assumptions regarding oil field development should be realistic, complete and supported by documentation. An impact analysis should include but not be limited to the following:

- *The extraction of gravel needed to construct roads and oil fields must be fully described and discussed. Gravel requirements have consistently and significantly surpassed assumptions.*
- *Direct and cumulative effects of seismic surveys. BLM should compile a map showing year-by-year the geographic array of all past seismic lines and the total concentrations.*
- *Predict impacts to air quality during construction and operations.*
- *An adequate analysis of water needs for development including a discussion of sources of water and the effects of drawdown on these sources. This is especially critical given that the assumptions regarding oil field development rely*

on this use of ice roads and enhanced recovery of oil.
• An analysis of water quality, expected pollutants and their including an analysis of meteorological factors and baseline conditions. Provide data on expected mobile or permanent sources or concentrations of air pollutants from development. The locations of wastewater treatment facilities and discharges should also be included. **(Comment No. 197617-053)**

Response To: Comment 197617-053

The effects from extraction of gravel needed to construct roads and pads was discussed for affected resources for each alternative in the Draft Amended IAP/EIS; Section 4.6.5.10 provides a history of gravel usage on the North Slope, and Gilders and Cronin (2000) noted that gravel usage for oil fields has been declining in recent years as the footprint of oil fields is getting progressively smaller. Figure 4-3 shows the location of seismic surveys that have been conducted in the Planning Area. Because some seismic data are proprietary, it is not possible to provide a complete and accurate assessment of past seismic activities. Additional information on the effects of construction activities on air quality has been included in the Air Quality sections for each alternative; impacts to air quality from operations are already provided in these sections. Sources of water and the effects of drawdown are discussed under Water Resources for each alternative, however, information on the effects from air pollutants on water quality has been included in the Final Amended IAP/EIS. Per ROP A-2(c, d), wastewater would be injected or hauled from the site. Discharge to surface water would be prohibited unless authorized by a National Pollution Discharge Elimination System (NPDES) permit. The need for an NPDES permit would be determined during NEPA analysis for the proposed development.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative B, Section 4.4.7, Fish, Effects from Gravel Extraction. Page 4-194. This subsection describes potential effects of gravel removal on fish overwintering and spawning areas during the open water period. The current industry practice is to mine gravel in winter when the ground is frozen and dry which allows them to obtain more material at reduced costs than would be obtainable in the open water period. While the effects described can occur during summer instream mining, the current practice does not produce these effects. ***(Comment No.*** **197620-088)**

Response To: Comment 197620-088

The EIS states that these effects would occur during the open water season. A statement has been added to the section indicating that current practices of winter gravel extraction would not produce these effects.

Comment From: Robert Franz (Comment Letter No. 197636)

The vast gravel bars, if used for their gravel in road building, would have a massive impact on the river. This is an area that a footprint needs to be very gentle. Oil exploration and development is not a gentle footprint. **(Comment No. 197636-008)**

Response To: Comment 197636-008

The BLM has established guidelines designed to substantially reduce the negative impacts of removing gravel materials from rivers, as discussed under ROP E-8. Recent development projects have attempted to avoid removing gravel materials from rivers. When evaluating the merits of removing gravel from a site, the BLM also evaluates the potential for the reclaimed site to provide fish and wildlife habitat. As noted in the response to Comment No. 197617-048, the potential to locate gravel resources in the Planning Area is limited.

TOPIC: HAZARDOUS MATERIALS AND WASTE

Comment From: Carol Wallace (Comment Letter No. 087251)

Until and unless the drilling industry can guarantee a mercury contamination-free method of drilling and extracting oil, it seems to me the height of folly to contaminate this pristine wetlands area that is so important to wildlife and to the well-being of current and future generations of human inhabitants. It would be far better to use any govern-ment subsidies/tax breaks on developing pollution free technologies for the future. **(Comment No. 087251-006)**

Response To: Comment 087251-006

Mercury (and specifically methylmercury) in the environment is a global issue and a global problem. However, the major pathway for mercury deposition to arctic regions is through the atmosphere (EPA 2001) from areas where large amounts of petroleum are combusted or treated, and not from drilling. The amount of mercury emitted to air, water, and solid waste streams from oil and gas exploration and production on the North Slope cannot be estimated with accuracy, but by far, the majority of mercury emissions occur as the oil is processed into fuel at refineries and when the fuel is used (U.S. EPA 2001).

There is mercury in the materials handled during exploration and drilling. Mercury is naturally present in the extracted oil or gas, in the drill cuttings (rock chips produced by the drill bit as it penetrates the earth), and in barite, a mineral used to create the drilling mud that lubricates the drill bit. Subsurface water that is produced along with extracted oil and gas may also contain mercury. However, the mercury in drilling wastes is in a solid, insoluble, nonmethylated form that cannot bioaccumulate in plants and wildlife. Environmental studies have been conducted on the North Slope to measure the concentrations of mercury and other contaminants in tundra soil and surface water located near drill sites. Mercury concentrations have occasionally been detected, but at low concentrations and often at or below naturally occurring background levels.

Furthermore under current State regulations and stipulations, drilling and production wastes (drill cuttings, used drilling muds, and produced waters) may not be discharged to the environment in the NPR-A. These wastes must be safely injected back into the ground or transported from the NPR-A and disposed of elsewhere according to environmental regulations. A grind-and-inject technology is now commonly used across the North Slope to inject drill cuttings and mud into permeable subsurface formation deep underground. In addition, much progress has been made in the last decade in the employment of low toxicity mud additives (Pacific Northwest Pollution Prevention Research Center 1993). Under normal operating conditions (barring spills or other unintentional releases) exploration and drilling in the NPR-A should result in no mercury-contamination of the environment. Some mercury could be emitted to the atmosphere by the combustion of gasoline, diesel or other fuels in equipment used for drilling.

Pacific Northwest Pollution Prevention Research Center. 1993. Pollution Prevention Opportunities in Oil and Gas

Comment From: Ruth S. Sperling (Comment Letter No. 196041)

Releases of toxic materials into wetlands, waterways, and the atmosphere as the result of petroleum development activities. **(Comment No. 196041-008)**

Response To: Comment 196041-008

The release of toxic materials into aquatic bodies from oil and gas exploration and development activities is discussed in the Water Resources sections for each alternative.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Section 3.2.10 must provide more details on known hazardous material sites within the planning area. A commensurate plan to clean up all known hazardous material sites within the planning area must be an integral part

of any new management plan for the region. The clean up must be accomplished on an expedited schedule. If oil and gas leasing can be placed on a fast track by the BLM, then clean up of known hazardous materials can likewise be undertaken aggressively. ***(Comment No. 196407-048)***

Response To: Comment 196407-048

Any detailed information concerning the nature and extent of any potential hazardous materials sites present are available on a site by site basis. A commensurate plan for cleanup of all known sites in the planning area and placement of those sites on an expedited schedule is outside the budgetary and procedural process for the Hazardous Materials Management program. Sites are identified and ranked by each field office. They are then reviewed by the hazardous materials functional group and prioritized and ranked on a statewide basis. This is done so that the limited dollars available for environmental cleanup work can be directed at those sites that pose the most imminent threat to public health and safety. As a additional procedure, where the sites may have a viable responsible party (i.e.: a person who caused the pollution) , BLM is committed to pursuing those individuals before expenditure of tax payer dollars.

TOPIC: IMPACT COMPENSATION

Comment From: Inupiat Community of the Arctic Slope (Comment Letter No. 197638)

In case the Western Arctic Caribou Herd or the Teshekpuk Herd population declines due to development on NPR-A, the Department of the Interior shall fund a reindeer/caribou husbandry program through the Regional Tribal Government (ICAS) for Barrow, Wainwright, Atqasuk & Nuiqsut. ***(Comment No. 197638-007)***

Response To: Comment 197638-007

Federal law requires that the State, in allocating its 50 percent share of sales, rentals, and bonus royalties from any leasing in the National Petroleum Reserve-Alaska, give "priority to use by subdivisions of the State most directly or severely impacted by development of oil and gas" in the Petroleum Reserve (P.L. 96-514). Under the law (AS 37.05.553), funds the State receives from leasing on the National Petroleum Reserve-Alaska are placed in the National Petroleum Reserve-Alaska Special Revenue Fund. These impact funds are distributed to communities through a grant program (19 AAC 50) administered by the Department of Community and Regional Affairs. The BLM believes that these monies are the appropriate type of compensatory assistance to enable local communities to establish a reindeer/caribou husbandry program.

Comment From: Delbert Rexford (Comment Letter No. 197974)

As noted by Assemblyman Hugo, this community should be considered very seriously to receive NPR-A impact funds. The socioeconomic impact -- the social impact on communities that lack the traditional foods, adversely affects the mental, emotional, and well-being of indigenous peoples. So the proposed activity has far-reaching effect. Not only is it in the national interest of the United States of America, but it is also to some degree to the detrimental impact of the indigenous people that are dependent on these sources of wildlife for sustaining their cultural way of life. ***(Comment No. 197974-162)***

Response To: Comment 197974-162

See response to comment 197638-007 under Impact Compensation

TOPIC: IMPACT EVALUATION

Comment From: Sharon Wyberg (Comment Letter No. 186677)

The BLM must study the complete impacts on the entire Teshekpuk Lake Surface Protection Area. We feel that it

clearly deserves our nation's most careful protection. It is not reasonable that your preferred alternative A would reduce protection to a scant 213,000 acres, less than five percent of the planning area. That level of protection will not begin to protect the geese, the caribou or the dozens of other species that now find safety there. ***(Comment No. 186677-010)***

Response To: Comment 186677-010

Making lands unavailable to oil and gas leasing is not the only means to protect biological, subsistence and other surface resources. In addition to decisions to make certain lands unavailable to leasing, other means presented in the Alternatives that provide considerable protection to important surface resources include leasing deferrals, No Surface Occupancy stipulations, seasonal restrictions, restrictions on types of vehicles, limiting types of aircraft and flight altitudes, fuel handling restrictions, etc.

Comment From: Sarah McGiffert (Comment Letter No. 187460)

Scientific evidence indicates that significant impacts could occur to fish and wildlife if more of this area is opened to oil development. ***(Comment No. 187460-003)***

Response To: Comment 187460-003

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Michael R. North (Comment Letter No. 196264)

Page 4-222. first paragraph regarding eiders. The statement that "The potential types of effects" of increased predation would be the same for Alternatives A and B is an example of obfuscation. The "types of effects" is not the issue the EIS needs to address; the issue the EIS needs to address is the magnitude or extent of the effects of alternative B versus Alternative A. ***(Comment No. 196264-016)***

Response To: Comment 196264-016

The statement merely indicates that similar rather than different types of impacts (i.e. gravel placement, noise, etc.) would occur and that all previously presented material regarding these impacts will not be repeated. In addition, magnitude and extent are addressed; the text does go on to say that there would be an increased risk of a spill under Alternative B compared to the No Action Alternative.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The linkage between onshore and offshore operations and impacts must be thoroughly analyzed, including the potential for a westward expansion of onshore facilities and staging areas to stimulate increased offshore industry interest. ***(Comment No. 196407-046)***

Response To: Comment 196407-046

We have revised the cumulative impacts sections on marine mammals and threatened and endangered species to reflect the possibility that westward expansion of onshore facilities may result in increased interest in offshore areas with concomitant increases in potential impacts to various resources in the offshore habitats.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-82, Effects on Marine Mammals, Endangered and Threatened Species; page 2-84 Subsistence Harvest Patterns: nowhere in any of these table sections is the potential for deflection of the fall westerly bowhead whale migration due to increased barge and vessel traffic discussed. Barrow subsistence whalers observed a significant

offshore deflection of the 2003 migration associated with barge operations at Camp Lonely far to the east. While the impact to Barrow subsistence harvests was apparent, the impact on the whales themselves was less clear. Bowheads utilize a traditional migratory corridor for reasons presumably tied to the availability of food resources or other factors related generally to their well-being. It must be assumed that deflection from this path is in some way detrimental to the individual animals affected. The development of substantial staging areas within the Northeast and Northwest planning areas of the NPR-A, including the potential for an industrialization of Barrow as a base of oil industry operations, would present a significant risk to spring and fall migrating whales, other marine species, and subsistence harvests. The table's conclusion that "in the context of cumulative impacts on the North Slope, all three alternatives would be similar and would likely be additive with other impacts occurring on the North Slope" is both counterintuitive and lacking in supporting analysis. The document explains that industry interest in areas that are now closed and would remain closed to leasing and operations under Alternative A is high. Most of these areas would be opened under Alternative B. All of them would be open under Alternative C. A successful expansion of industrial facilities into these areas would certainly facilitate and enhance the likelihood of continued expansion along the Barrow Arch geologic formation into the Northwest NPR-A Planning Area and in adjacent offshore areas. This must be recognized and the potential impacts analyzed. ***(Comment No.* 196407-082)**

Response To: Comment 196407-082

The Final IAP/EIS has been revised in consideration of your comments. Information was added to Section 4.3.14.2 Oil and Gas Exploration Activities, Effects of Disturbance; Section 4.4.14.2 Oil and Gas Exploration Activities, Effects of Disturbance; 4.5.14.2 Oil and Gas Exploration Activities, Effects of Disturbance; and 4.6.14.2 Oil and Gas Exploration Activities, Effects of Disturbance on the potential for offshore barge and vessel traffic to impact bowhead whale migration patterns under each alternative.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

In 3rd paragraph, p. 4-210, the DEIS acknowledges that the impacts of the Preferred Alternative to terrestrial mammals would be greater than the No Action Alternative because of the larger development scenario. However, it is inferred that the degree of impact would result from developing only "...345 to 4,310 additional acres of habitat..." This represents a very low estimate in terms of a development scenario, and it significantly underestimates the potential impacts to mammals, such as calving caribou or caribou seeking insect relief. In fact, the TLSPA was reduced by 75 percent to a no-lease zone of 213,000 acres. The reference to a few hundred or few thousand acres only relates to the actual footprint of habitat covered by gravel, and not to the broader effects of the oilfield infrastructure. For example, caribou in the Central Arctic Herd were displaced by up to 2.5 mi from development infrastructure during calving. Thus, the impacts of development go well beyond the direct acres affected by development. ***(Comment No.* 197610-025)**

Response To: Comment 197610-025

The text analyzes the impacts associated with avoidance of and displacement from infrastructure. The statement referred to specifically addresses the direct loss of habitat from gravel placement. We have revised the text to make it more explicitly state that functional habitat loss would also be greater for these alternatives given the increased development scenario.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

On p. 4-214, the DEIS again acknowledges that the Preferred Alternative would have greater impacts on caribou than would the No Action Alternative. However, there is no clear quantification of those impacts. Later, it is inferred that the 213,000 acre no-lease area and stipulations in the areas open to leasing would protect caribou at Teshekpuk Lake. These assurances, however, are based on few data, and there is little analysis to demonstrate that there are adequate conservation safeguards for this important caribou herd. Although the DEIS acknowledges that the Preferred Alternative has greater impacts than the No Action Alternative, it is difficult—if not impossible—to evaluate how much greater those impacts would be. We simply cannot accept on faith that the additional impact will be minimal, but that is what the DEIS asks us to do. ***(Comment No.* 197610-029)**

Response To: Comment 197610-029

The Final IAP/EIS has been revised in consideration of your comments. The following text was added to Section 4.6.9.1 Terrestrial Mammals, Oil and Gas Development Activities, Effects of Disturbance, Caribou, "Some TLH caribou movements during the insect-relief season (late June-August 15) would likely be affected by pipelines and road traffic. The critical part of the movement to the coastal insect-relief area is through the narrow corridor between Teshekpuk Lake and the Kogru River. Caribou must pass through these corridors to get to and from insect-relief areas. The area to the east of Teshekpuk Lake is a particular problem because nearly all of the parturient cows pass through this area either shortly before or after calving (Carroll Pers. Comm.). Any development that occurs on the limited amount of habitat that is used by caribou migrating through this corridor would likely affect caribou movements. Stipulation K-9 designates an NSO area extending from the eastern shore of Teshekpuk Lake approximately 4 miles eastward towards the Kogru Inlet (approximately 116,000 acres). The NSO designation prohibits permanent oil and gas facilities including major rights-of-way such as pipelines and roads. This stipulation should protect enough land to allow caribou use of this major migration corridor. However, pipelines could be allowed in the NSO area north of Teshekpuk Lake and south/southeast of the lake. Careful siting of pipeline and road rights-of-way would still be required to prevent affects on caribou use of this corridor. Additionally, the areas that would be excluded from surface occupancy do not extend to the coast suggesting that there could be some development along the coastline. While a set-back from the coast is stipulated (Lease Stipulation K-6), development in the coastal area would likely impact caribou use of insect-relief areas near the coast, though the number of developments would be restricted by stipulation K-11."

The following information was also added to Section 4.4.9.1 Terrestrial Mammals, Oil and Gas Development Activities, Effects of Disturbances, Oil and Gas Development, Caribou, "Under the Preferred Alternative, the region northeast of Teshekpuk Lake would be excluded from leasing. However, pipelines could be allowed in the excluded area as a result of technological limitations, economics, logistics, or other factors. The result would be an increased potential for oil and gas development activities to affect caribou use of this corridor. Additionally, the area that would be excluded from leasing does not extend to the coast, except near Cape Halkett, suggesting that there could be some development along the coastline. While a set-back from the coast is stipulated (Lease Stipulation K-6), development in the coastal area would likely impact caribou use of insect-relief areas near the coast."

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

On p. 4-381, 2nd paragraph, the DEIS states: In the context of the ACP and North Slope, however, the amount of potential bird habitat that could be directly or indirectly impacted long term by oil and gas activities on the planning area and elsewhere on the North Slope would be small—approximately 0.3 percent of the ACP and 0.08 percent of the North Slope. In terms of potential impacts to birds, this statement is virtually meaningless and highly misleading. Birds do not use the Arctic Coastal Plain uniformly. They concentrate in localized, optimal habitats for nesting, brood rearing, molting, and staging. If there is substantial development in a high-density nesting or molting area, there could be significant population impact. The Teshekpuk Lake molting goose area is unique in the circumpolar Arctic, and if there were to be substantial development there, the weight of expert opinion indicates that it could have significant population-level impacts for some species, such as brant. ***(Comment No. 197610-060)***

Response To: Comment 197610-060

The Final IAP/EIS has been revised in consideration of your comments. In Section 4.6.9.8 Birds, Cumulative Analysis, the following text was added to this section, "Birds are not distributed evenly across the Planning Area and some areas and habitats are more important to some species than others. Areas northeast and northwest of

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

On p. 4-386, the DEIS states: "The effects of future project infrastructure on bird populations, although additive to natural effects, would be expected to be less severe than those associated with previous Arctic oil field developments." This conclusion is entirely unsubstantiated and misleading. There never has been a development in an area like the Teshekpuk Lake goose molting habitat, so what is the basis for this conclusion? ***(Comment No. 197610-062)***

Response To: Comment 197610-062

The Final IAP/EIS has been revised in consideration of your comments. The last sentence of this paragraph in Section 4.7.6.8 Birds, Cumulative Analysis, Effects of a Large Spill, Conclusion, was changed to read, "In general the effects of future project infrastructure on bird populations, although additive to natural effects, would be expected to be less severe than those associated with previous Arctic oil field developments because new technologies have reduced the size of the footprint for current oil field developments. If development-related disturbances affect birds in the goose molting area when large concentrations of geese have gathered to molt, however, impacts could be more severe than those associated with previous developments."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The impacts of additional leasing and increased surface occupancy in the Teshekpuk Lake Special Area are also not fully considered in the Amended Draft EIS. This is an area that is recognized for its importance to caribou, waterfowl and subsistence users. Impacts to these surface resources and resource users need to be adequately analyzed. ***(Comment No.* 197616-009)**

Response To: Comment 197616-009

Please see Chapter 4 in the final document for a complete description of the Basic Assumptions for the Environmental Consequences Assessment as well as a complete description of the Effects of the Cumulative Case.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Finally the sociocultural and socioeconomic impacts on the community of Nuiqsut from the proposed changes are not adequately described or considered. ***(Comment No.* 197616-010)**

Response To: Comment 197616-010

Under "Sociocultural Systems" in Chapter 4 ("Environmental Consequences") of the IAP/EIS, societal stress as well as changes in social organization and cultural values within North Slope communities, including Nuiqsut, are identified as a possible impacts from oil and gas development. Without more specific information we are not sure how to address your concerns.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Nowhere in the Amended Draft EIS is there any analysis of the impact of the many lowered levels of protection offered by Alternatives B and C that we have identified in this section. The Amended Draft EIS is incomplete and inadequate if it does not acknowledge and properly analyze the effects of such diminished protections. ***(Comment No.* 197616-113)**

Response To: Comment 197616-113

We do not believe we have lowered the level of resource protection, see response to comment 196407-011 under Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Even where the analysis in the Amended Draft EIS of the impacts of Alternatives B and C is not based on a comparison to the 1998 NE NPR-A ROD, it still fails to consider the actual mitigation measures proposed for Alternatives B and C. Take the discussion of impacts of Alternative B on wildlife for example. In this section it says that stipulation D-1 would "prohibit exploratory drilling in lakes streams and floodplains unless impacts to wildlife are minimal."113 There is no mention that exploratory drilling in lakes, streams and floodplains would also be allowed if there is no feasible or prudent alternative. The Amended Draft EIS goes on to say that exploratory drilling

would be limited to temporary facilities unless the lessee demonstrates that construction of permanent facilities is environmentally preferable.114 There is no mention or discussion in the text of this section of the Amended Draft EIS that permanent facilities could be constructed to support exploration if it would be more economical. ***(Comment No. 197616-114)***

Response To: Comment 197616-114

The flexibility built in to many of the Stipulations and Required Operating Procedures is not to be construed as an additional exception process but as a mechanism to address resource issues based on project-specific information; see responses to 196264-006, 196407- 011, 015, 037, 038 and 059 under Stipulations and Required Operating Procedures. Prescriptive based mitigation often attempts to define a requirement with a one size fits all approach that does not allow adjustments when site and project information is available. The stipulations and Required Operating Procedures that have been developed for the Action alternatives are intended to allow BLM through its permitting and authorization process (see Chapter 2) to use project-specific information (that does not now exist) to refine the requirements and define them in the context of the project to better meet the stated objectives. We believe this is a far more effective approach than to try to define these standards using the "one size fits all" approach based on hypothetical situations. Necessary consultation with other agencies and local communities will occur as part of the permitting process.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

These conditions severely weaken the effectiveness of these two stipulations as mitigation measures. Until the actual ROPs and lease stipulations proposed for Alternatives B and C are considered, the Amended Draft EIS does not take a hard look at whether the impacts of Alternatives B and C would be the same as those under 1998 NE NPR-A ROD. ***(Comment No. 197616-115)***

Response To: Comment 197616-115

We do not believe we have lowered the level of resource protection, see response to comment 196407-011 under Stipulations and ROPs.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Petroleum Operations - Technology Advancement. This section claims that a number of operations will have less environmental impact, yet does not provide references for this information. These is no reason the public should take these at face value and BLM must document the supporting evidence. Instead of just touting the benefits of technological advances, the draft Amended IAP/EIS should also acknowledge their limitations. For instance, the NRC reported noted the limits to reducing footprint size by placing wells more close together: In the current design, which is used for pads at the Alpine oil fields, wells at 43c (109f) are spaced only 3m (10 ft) apart (Hazen 1999). Accommodating such a concentration of heat in permafrost requires sophisticated design with extensive refrigeration by passive heat pipes (or thermo-siphons) and insulation. Hazen (1999) calculated that, without refrigeration the thaw chimneys would coalesce at all depths, and all the permafrost—about 300 m (1,000 ft) thick—under the row of wells would thaw. Then, the natural surface, gravel pad, and well houses would settle nonuniformly from 2 to 6 m (6.5 to 20 ft). With refrigeration to a depth of 15 m (50 ft) and insulated conductor pipe to 24 m (80 ft), Hazen (1999) estimated that all of the permafrost except for the top 12 m (40 ft) will thaw. NRC at 109. And despite promises to use the "best available technology" the proposed stipulations no longer require the use of that technology. An explanation must be provided in order to adequately assess the feasibility of these technology advancement claims (draft IAP/EIS at 2-54). ***(Comment No. 197617-043)***

Response To: Comment 197617-043

As noted in the document the list provided was an update of information provided in the 1998 Northeast IAP/EIS

Comment From: Environmental Coalition (Comment Letter No. 197617)

It is impossible and inappropriate to conclude that areas presently off-limits to leasing or development can be safely developed. There is no justification for a conclusion that the limited exploration that has occurred in any way demonstrates that development can safely occur. This is a particularly egregious claim considering the Research Monitoring Team mandated by the 1998 ROD has yet to implement a monitoring program, the industry's first full field development proposal outlines a level of development specifically prohibited in the 1998 ROD and BLM is expanding the activities allowed for oil and gas exploration. **(Comment No. 197617-071)**

Response To: Comment 197617-071

Industry has a long history of "safely" exploring on the North Slope which includes areas in the Northeast Planning area. We have carefully developed a series of mitigation measures that will minimize the impacts to the surface resources throughout the planning area.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Page 5, Summary of Impacts: The first bullet and the first full paragraph indicate that caribou migration and insect-relief habitat would be protected under the draft Preferred Alternative. The majority of the TLH, including cows with calves at the time when they are most sensitive to disturbance, must pass through narrow pieces of land or "pinch points" to the east and northwest of Teshekpuk Lake to reach insect-relief habitat. These critical areas would be open to leasing and development under both the draft Preferred Alternative and Alternative C. These migration corridors are currently protected as no-lease or no-surface-occupancy areas. The risks associated with opening these areas to leasing should be discussed relative to the degree of protection provided by the Alternatives. **(Comment No. 197618-007)**

Response To: Comment 197618-007

The Proposed Action has specifically added NSO areas to protect the "pinch point" referred to, see Stipulation K-9 and K-10. Impacts to caribou in the calving area under Alternatives B and C are discussed in Sections 4.4.9.1 and 4.5.9.1, respectively.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.9.2, Page 4-21 7, Conclusion, Paragraph 1 : Please insert the word "likely" between "would' and "be" in the first sentence. **(Comment No. 197618-091)**

Response To: Comment 197618-091

The page has been modified.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 2, Alternatives, Section 2.9, Impacts to Current and Future Lease Holders from Revisions to 1998 Northeast IAP/EIS ROD. Page 2-34. The text in this section notes that changes to existing stipulations and the offering of additional lands for leasing may occur through this current process. It further states that it is speculative to estimate or analyze the impacts of leasing that has not yet been authorized. We recommend deleting this sentence because this logic could also be applied to speculation regarding estimation of potential impacts (key components of the Environmental Consequences section.) **(Comment No. 197620-049)**

Response To: Comment 197620-049

Section 2.9 has been modified. Also, see response 197618-038 under Stipulations and ROPs.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Section 4.1, Preview of this Section, Page 4-6. The first paragraph on this pages states "the State of Alaska has oil discharge and contingency planning regulations that contain requirements to minimize wildlife hazing." There are no such regulations that contain requirements to minimize wildlife hazing. ***(Comment No. 197620-069)***

Response To: Comment 197620-069

The State of Alaska has clarified previous communication on this subject and the text has been revised to reflect the following information:

While there are no such hazing regulations specific to contingency plans, the State reviews oil discharge and contingency plans for appropriateness of wildlife protection measures.

There are also the following statutes and regulations that prohibit "hazing" or "harassment" of wildlife.

AS 16 Sec. 16.05.920. Prohibited conduct generally.
(a) Unless permitted by AS 16.05 - AS 16.40, by AS 41.14, or by regulation adopted under AS 16.05 - AS 16.40 or AS 41.14, a person may not take, possess, transport, sell, offer to sell, purchase, or offer to purchase fish, game, or marine aquatic plants, or any part of fish, game, or aquatic plants, or a nest or egg of fish or game.
the term "take" is means taking, pursuing, hunting, fishing, trapping, or in any manner disturbing, capturing, or killing or attempting to take, pursue, hunt, fish, trap, or in any manner capture or kill fish or game
5 AAC of the Alaska Administrative Code provides:
5 AAC 92.080(5) except as otherwise specified, with the use of an aircraft, snow machine, motor-driven boat, or other motorized vehicle to harass game or for the purpose of driving, herding, or molesting game;
the term "harassment" means to repeatedly approach an animal in a manner which results in the animal altering its behavior;

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative B. Section 4.4.9, Mammals, Oil and Gas Development, Caribou, Page 4-2 10.Calving and Insect Relief Habitats The third paragraph on Page 4-210 suggests that impacts to caribou under the preferred alternative would affect approximately 345 to 4,310 additional acres of habitat when compared to the no action alternative. This anticipated impact to additional acres of habitat underestimates the potential impacts to calving caribou and caribou seeking insect relief. The few hundred or few thousand acres primarily relates to the actual footprint of habitat loss, whereas the area that is actually affected by the network of drill pads, roads, pipelines, bridges, and power lines, and the disturbance zone around them that would come with development (functional habitat loss), would be greater. ***(Comment No. 197620-089)***

This statement of area specifically refers to the size of the gravel footprint and compares it to the gravel footprint under the no action alternative. The analysis of the potential impacts from such a footprint follow in the paragraphs of the next section titled "caribou". Some portions of these paragraphs have been revised to make more explicit the relationship between direct habitat loss and functional habitat loss.

TOPIC: IMPACT EVALUATION

ISSUE: MOLTING GEESE

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Specific Concerns: In the comparison of alternatives (p. 2-81), the DEIS recognizes likely impacts to "small numbers

of nesting birds." This analysis understates likely impacts of Alternatives B and C to nesting birds and fails to even mention impacts on the thousands of geese that molt north of Teshekpuk Lake. ***(Comment No. 197610-055)***

Response To: Comment 197610-055

The Final IAP/EIS has been revised in consideration of your comments.

TOPIC: INFRASTRUCTURE

Comment From: Conoco Phillips (Comment Letter No. 196557)

Sufficient transportation corridors would be available to access land between these No Surface Occupancy areas and directional drilling technology would allow access to potential hydrocarbon resources beneath these lakes. Proceeding in this manner would permit the discovery and removal of oil and gas deposits in a manner consistent with the original intent behind the creation of the Petroleum Reserve. ***(Comment No. 196557-031)***

Response To: Comment 196557-031

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Conoco Phillips (Comment Letter No. 196557)

CPAI also suggests that any areas proposed for restricted surface activities or No Surface Occupancy, including buffer areas, take into consideration the differences in activity or type of infrastructure. For example, there is a substantial difference between a processing facility versus a drill site. A processing facility, with its additional infrastructure needs (oil processing, gas handling, a camp, etc.) may not be appropriate for some areas but a drill site might be acceptable. As currently identified in the DEIS there is no distinction between different types of activities or infrastructure. Additionally, seasonal restrictions would be more appropriate to impose in sensitive areas rather than a blanket exclusion. For example, the proposed restrictions on construction activity from May 20 to August 20 in Stipulation K-4 for the Geese Molting Area would allow for protection of the geese while still allowing development to occur. As with any of our projects, CPAI will work closely with agencies and local residents during site-specific NEPA analysis efforts to evaluate the suitability of different types of facilities in each area. ***(Comment No. 196557-034)***

Response To: Comment 196557-034

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Assumptions regarding oil field development should be realistic, complete and supported by documentation. An impact analysis should include but not be limited to the following:

• The impacts of a creating a network of connecting access roads, pipelines airstrips, docks, support bases and other infrastructure. ***(Comment No. 197617-052)***

Response To: Comment 197617-052

The analysis in the IAP/EIS considers the potential impacts of a localized network of connecting infrastructure and access routes.

TOPIC: JURISDICTIONAL ISSUES

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

On page 3-100 and elsewhere, the document states or implies that the North Slope Borough has no authority to place conditions on development in the NPR-A. The DEIS fails to provide any analysis to support that conclusion. The Borough has concurrent jurisdiction in the NPR-A, derived from the jurisdiction transferred to the state under the Alaska Statehood Act and our status as a home rule municipality. No federal or state legislation enacted subsequent to the Alaska Statehood Act has eliminated or removed concurrent jurisdiction and the federal regulatory scheme is inadequate to address all local and environmental concerns. The IAP/EIS must recognize Borough zoning and permitting authority and address the permit review, rezoning, and other governing provisions, criteria, and processes described in the Borough Charter and Municipal Code. **(Comment No. 196407-052)**

Response To: Comment 196407-052

Application of the NSB's land management regulations to oil and gas exploration and development activities on federal land within the National Petroleum Reserve-Alaska is subject to significant legal constraints, and therefore must be evaluated on a case-by-case basis as particular activities are proposed.

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that all navigable waters be defined in the plan per the Gulkana decision. **(Comment No. 196937-004)**

Response To: Comment 196937-004

The Naval Petroleum Reserves Production Act of 1976 (Public Law 94-258) withdrew all lands, including submerged lands, within the Planning Area for a Petroleum Reserve. This withdrawal defeated the state's title to the beds of navigable waters (United States of America v. State of Alaska [No. 84, Original]) Supreme Court, June 19, 1997.

TOPIC: LAND EXCHANGE

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that all federal withdrawals including Public Land Orders, secretarial orders, congressional acts, etc. be identified on the maps and that the purpose of each be included in the Plan, especially those for which the defined purpose of the withdrawal no longer exists. **(Comment No. 196937-001)**

Response To: Comment 196937-001

The entire planning area is within the National Petroleum Reserve – Alaska; as such it is reserved and withdrawn from all forms of entry and disposition under the public land laws including the mining and mineral leasing laws and all other Acts by the Naval Petroleum Reserves Production Act of 1976, April 5 1976 (Public Law 94 – 258). In designating the area a Petroleum Reserve the Act authorized the Secretary to: 1) make dispositions of mineral materials pursuant to the Act of July 31, 1947; 2) grant rights-of-way, licenses and permits necessary to carry out "his" responsibilities under the Act; and 3) convey the surface of lands properly selected on or before December 18,

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that all state selections and Native selections be identified in the Plan and shown on the maps. It is important that everyone reviewing the Plan know that these selected lands will in all likelihood become State or Native lands at some point in the future. **(Comment No. 196937-002)**

Response To: Comment 196937-002

Lands within the Petroleum Reserve were never available for State selection. All lands that have been selected by Native corporations have been interim conveyed or patented and are shown on Map 1-5. Kuukpik Corporation (Nuiqsut) is entitled to additional lands but those selections have not been made at this time.

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that the Plan include and integrate the State of Alaska land selections that were established for access roads everywhere in the planning area that they exist. Thank you for the opportunity to participate in this planning effort. We are always available to review ideas and concepts regarding minerals. If you have any questions, please contact me. ***(Comment No. 196937-012)***

Response To: Comment 196937-012

To date, no claims for R.S. 2477 rights within the National Petroleum Reserve-Alaska have been asserted by the State of Alaska or other qualified party.

TOPIC: LAND OWNERSHIP AND USES

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Map 3-35: appears to have omitted split estate lands around the community of Nuiqsut. ***(Comment No. 196407-093)***

Response To: Comment 196407-093

The BLM defines split estate lands for the purposes of this document as a situation where the BLM manages the surface or sub-surface. The situation around Nuiqsut is that the surface and the sub-surface are owned by different Native Corporations, but neither is managed by BLM. Therefore, we believe Map 3-35 is accurate as there are no split estate lands around the community of Nuiqsut.

TOPIC: LEGAL

Comment From: David Addison (Comment Letter No. 135985)

Whatever the Final Environmental Impact Statement (FEIS) may state, I do trust that you will continue to keep the following in mind: BLM Mission: It is the mission of the Bureau of Land Management to sustain the health, diversity and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau of Land Management administers public lands within a framework of numerous laws. The most comprehensive of these is the Federal Land Policy and Management Act of 1976 (FLPMA). All Bureau policies, procedures and management actions must be consistent with FLPMA and the other laws that govern use of the public lands. ***(Comment No. 135985-005)***

Response To: Comment 135985-005

The BLM agrees with your assertion our policies, procedures and management actions must be consistent with FLPMA, NEPA, NPRPA, and a host of other laws that govern use of the public lands, specifically see Section 1.8. We do not agree with your assertion that BLM has violated our Mission-the final Proposed Action provides a rigorous mitigation package that will sustain the health, diversity and productivity of the public lands in the Northeast Planning Area.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The leases BLM is planning to issue in the draft IAP/EIS represent an irretrievable commitment of resources because the lessee is given the right to develop oil and gas. Courts have established that oil leases, such as those proposed here, that do not preclude surface occupancy represent an irreversible and irretrievable commitment of resources. See Bob Marshall Alliance, 852 F.2d at 1227; Burford, 848 F.2d at 1451; Sierra Club v. Peterson, 717 F.2d at 1414. As the court found in Burford it is too late to perform site specific analysis after the commitment has been made. BLM has already made the choice to give the oil companies the right to develop oil. Promises to conduct future NEPA analysis are only relevant if the agency retains the authority to say "no" to development. **(Comment No. 197617-039)**

Response To: Comment 197617-039

While a lease does give the lessee the right to develop the oil and gas resources, however, it does not grant the lessee carte blanche to develop those resources at any cost or without regard to the impacts to the surface resources, or communities that depend upon those surface resources for their existence. BLM can and does impose many restrictions at the operational stage through the authorization process to protect these resources from oil and gas activities including development.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Accordingly, if BLM intends that the draft IAP/EIS be the basis for authorizing oil and gas leasing in particular areas of the Reserve, it must be scaled so that it is site-specific. An adequate site-specific analysis cannot rely on a hypothetical development scenario not tied to any particular location and a general, region wide assessment of total affects. BLM must instead assess the impacts of potential oil exploration and development on all the resources of particular areas. Until this analysis is done, the IAP/EIS may serve as programmatic planning document, but cannot be used as a basis for entering into oil and gas leases. **(Comment No. 197617-040)**

Response To: Comment 197617-040

The Draft Amendment IAP/EIS (DEIS) fully satisfies the project-specificity requirement of NEPA. Chapter 3, Description of the Environment, of the DEIS provides detailed, project-specific information about the environment that would be affected by the various alternatives, including the physical, biological, socio-economic and cultural resources in the planning area. Summarizing existing scientific studies and surveys conducted on each resource in the planning area, Chapter 3 and its accompanying maps presents in-depth information regarding the different soil and vegetation types and their locations, climate, air quality and surface and ground water resources in the planning area. Detailed scientific information is also provided regarding the various fish, bird, marine and terrestrial mammal, and endangered and threatened species, their known locations, the time of year present and their concentrations in the planning area during the year and during different life stages. For example, the DEIS discusses prime molting, nesting and brood0rearing areas for birds; calving, insect relief and wintering areas for caribou; and polar bear denning sites; etc. Human communities, their socio-economic and ethnic composition, uses of the land, transportation corridors and the importance of subsistence in the planning area are also described and illustrated on maps. Specific information about known historic, paleontological and cultural resources of the planning area is discussed, as well as information about wild and scenic rivers and the varied scenic, visual, recreational and wilderness resources in the planning area. Information received from public comments on the DEIS has been incorporated into the Final Amended IAP/EIS where appropriate. The project-specific information in Chapter 3 provides the basis for the detailed and analysis of direct, indirect, and cumulative environmental impacts in Chapter 4. In Chapter 4, reasonable exploration and development scenarios are described in detail for each alternative. These scenarios are based on known information about the oil and gas potential of the planning area and existing industry technology. The scenarios used in the DEIS are the same kinds of scenarios utilized in the final 1998 Northeast IAP/EIS and commonly used in many places by various agencies. Applying the scenarios under each alternative to the project-specific information from Chapter 3 about the varied resources in the planning area, environmental analysts predict the potential environmental impacts of projected leasing, exploration and development on different resources in the planning area under each alternative. This project-specific information about the various impacts on resources associated with each alternative will inform

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM's management of cultural resources is governed and guided by a host of laws, orders, and regulations. These include, but are not limited to, the Antiquities Act of 1906, the National Historic Preservation Act (NHPA), Executive Order 11593, the Archaeological Resources Protection Act (ARPA), and the Native American Graves Protection and Repatriation Act (NAGPRA). BLM's decisions regarding cultural resource management are also governed by the Federal Land Policy and Management Act (FLPMA) and the National Environmental Policy Act (NEPA). ***(Comment No.* 197617-114)**

Response To: Comment 197617-114

We don't disagree.

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM's management of cultural resources is governed and guided by a host of laws, orders, and regulations. These include, but are not limited to, the Antiquities Act of 1906, the National Historic Preservation Act (NHPA), Executive Order 11593, the Archaeological Resources Protection Act (ARPA), and the Native American Graves Protection and Repatriation Act (NAGPRA). BLM's decisions regarding cultural resource management are also governed by the Federal Land Policy and Management Act (FLPMA) and the National Environmental Policy Act (NEPA). ***(Comment No.* 197617-114)**

Response To: Comment 197617-114

We don't disagree.

Comment From: Environmental Coalition (Comment Letter No. 197617)

By proposing to remove 75 % of the protections for the Teshekpuk Lake Special Area and to allow new oil and gas development, BLM is violating NPRPA, NEPA, FLPMA and other legislative mandates. By the agency's own admission the Preferred Alternative's Additional Protection Areas "are not in themselves administrative or legislative designations, and they carry with them no new regulatory authority. They simply are areas that BLM has identified where resource concerns exists" (draft IAP/EIS at 2-5). BLM can not claim that these Additional Protections are adequate to meet the "maximum protection" standard. ***(Comment No.* 197617-120)**

Response To: Comment 197617-120

See responses to comments 183937-005, 196949-011 and 197617-072 under Special Designation Areas.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Furthermore, the Analysis does not discuss the relevant sections of the Naval Petroleum Reserves Production Act (NPRPA). The NPRPA requires the Secretary of the Interior to give "maximum protection" to "any significant subsistence ... fish and wildlife ... values." 42 U.S.C. § 6504(b). The House Report accompanying passage of NPRPA says that the statute requires that the "Secretary of the Interior should take steps to minimize any adverse effects on native subsistence requirements and associated fish and wildlife values", and suggests scheduling of exploration activities as one way to reduce such impacts. U.S. House of Representatives, Interior and Insular Affairs Committee, House Report No. 94-81, Part I, p. 21 (March 18 and April 22, 1975), to accompany H.R. 49. The NPRPA, therefore, provides an independent basis for requiring the Secretary to chose an alternative, and mitigation measures, that satisfy any legitimate NPRPA oil and gas leasing objectives but which offers the maximum protection possible to subsistence resources. The ANILCA 810 discussion does not take into account the Secretary's NPRPA additional obligations concerning subsistence. ***(Comment No.* 197617-160)**

Response To: Comment 197617-160

See responses to comments 183937-005, 196949-011 and 197617-072 under Special Designation Areas and 196407-035 under Stipulations and ROPs. Also, we believe we have fully complied with the requirements of ANILCA Section 810.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Section 2.6 the draft IAP/EIS asserts that : An oil and gas lease does not in itself authorize any on-the-ground activity. Seismic operations, drilling, ice road construction, pipeline construction, etc., require additional land use authorizations. Any applicant requesting such authorization will have to address the stipulations and ROPs either before submitting the application (e.g., for subsistence consultation, brant surveys) or as part of the application proposal (e.g., for a proposal stating that garbage will not be buried, or that pipelines and roads will be separated by 500 feet or more). Id. at 2-12. This statement leaves the misimpression that BLM intends to retain authority to deny the lessees the right to enter on their leases to explore and produce oil and gas, i.e., that BLM intends to issue so-called No Surface Occupancy leases. The leases BLM previously issued for the tracts within the Northeast corner Planning Area, however, were not No Surface Occupancy leases. See Lease Form AK-3130-1 (April 1999). Unless BLM intends otherwise, the draft Amended IAP/EIS needs to make plain that BLM does not intend to issue No Surface Occupancy leases for tracts within the Planning Area. **(Comment No. 197617-172)**

Response To: Comment 197617-172

The lease does give the lessee the right to enter leases to explore and develop oil and gas resources. However, the lease does not give the lessee unconditional access or use of the surface resources. BLM, through the permitting process, would require lease to abide by restrictions developed through the planning/NEPA process to protect surface resources. Each alternative provides a different strategy for protecting surface resources.

TOPIC: MARINE MAMMALS

Comment From: State of Alaska (Comment Letter No. 197620)

Map 3-25, Bowhead Whale Density. The years of survey should be included with this map so the reader can determine if the map is based on one year or several years of data. **(Comment No. 197620-067)**

Response To: Comment 197620-067

The Final IAP/EIS has been revised in consideration of your comments. Map 3-25 was updated to include the years of survey.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative A, Section 4.3.9.2, Marine Mammals, Effects of Disturbance, Page 4-120. The third paragraph on this page states that disturbance from air traffic could lead to abandonment or trampling of spotted seal pups by larger seals. The coastline of the NE NPR-A planning area is not used by spotted seals for pupping. **(Comment No. 197620-084)**

Response To: Comment 197620-084

The Final IAP/EIS has been revised in consideration of your comments. The information on trampling of spotted seal pups was deleted from Section 4.3.9.2 Marine Mammals, Effects of Disturbance in the EIS according to the information stated in the comment.

TOPIC: MARINE MAMMALS

ISSUE: POLAR BEARS

Comment From: Environmental Coalition (Comment Letter No. 197617)

D. MARINE MAMMAL PROTECTION The draft EIS/IAP fails to consider adequately the impacts that oil development and exploration may have on the polar bear population in the Planning Area, and it fails to provide adequate protections for this sensitive species. Specifically, the draft Amended IAP/EIS fails to consider adequately or provide sufficient protection for potential impacts of: seismic activity on denning bears, impacts of oil spills on the population directly and on polar bear food sources, human disturbance such as exposure and habituation to human food and DLP kills, bioaccumulation of toxics caused by releases into the air and water, and climate change. **(Comment No. 197617-103)**

Response To: Comment 197617-103

The Final IAP/EIS has been revised in consideration of your comments. Additional information to address the potential impacts on polar bears from the sources listed in the comment have been added to Sections 4.7.6.9 Terrestrial Mammals, Impacts from Oil and Gas Development, Marine Mammals, Cumulative Analysis; Section 4.3.9.2 Marine Mammals, Oil and Gas Exploration and Development Activities, Effects of Spills; and 4.4.9.2 Marine Mammals, Oil and Gas Exploration and Development Activities, Effects of Disturbances.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Moreover, we have serious concerns regarding the increased authorization of incidental take permits of polar bears. Such takes of polar bears incidental to oil and gas activities can be authorized under section 101(a)(5)(A) of the MMPA. They are being sanctioned for large areas, both on and offshore, and are now also being allowed for year round oil and gas activities. These wide-ranging allowances, particularly permitting incidental takes during the winter months, lead to a much greater probability that the species will be impacted. USFWS has noted that winter oil and gas activities associated with exploration "have a far greater possibility of having a detrimental impact on the polar bear." 58 Fed. Reg. 60,402 at 60,406 (Nov. 16, 1993). In addition to having a more significant impact, interactions with polar bears are more likely during winter due to increased bear movements during this period. **(Comment No. 197617-104)**

Response To: Comment 197617-104

Authorizations for incidental takes are issued by the USFWS and are subject to their review and approval.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Further, the United States has failed to fulfill its obligations to protect polar bears as required by the 1973 Agreement ***(Comment No.*** **197617-105)**

Response To: Comment 197617-105

All of the alternatives in the Final EIS provide protection for polar bears by restricting Coastal shorelines from permanent oil and gas activities, specifically see Stipulation K-6. Also, the stated objective of ROP C-1 is to "protect grizzly bear, polar bear, and marine mammal denning and/or birthing locations" and is followed by a strict requirement standard requiring consultation with USFWS and/or NOAA Fisheries Service before initiating any activity

Comment From: Environmental Coalition (Comment Letter No. 197617)

In order to comply with the Agreement, the Secretary of the Interior directed USFWS in 1993 "to develop and begin

implementing a strategy for the identification and protection of important polar bear habitats." Despite this mandate, USFWS has yet to protect important polar bear habitat in a manner that complies with the Agreement. Moreover, during the thirty years that the Agreement has been in force, few affirmative steps have been taken to safeguard polar bear habitat, while oil and gas activities have proliferated throughout the arctic. The continued expansion of the oil and gas industry has had a detrimental impact on the polar bear. ***(Comment No.* 197617-106)**

Response To: Comment 197617-106

See response to comment 197617-105 under Marine Mammals - Polar Bears

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Table 2-3, Page 2-82, Effects on Marine Mammals, General Effects (Preferred Alternative): The table accurately reflects that the Preferred Alternative, if selected, has the potential for increasing disturbances to marine mammals through increased levels of seismic, aircraft, overland, and barge activities. However, the conclusion that "effects would be localized and short term, and would not substantially affect marine mammal populations" is misleading because the effects to polar bears would actually depend on the level and duration of increased seismic, aircraft, overland, and barge activities, as well as other factors such as the age, sex, number, and distribution of bears during the specified activities, availability of prey, availability of suitable denning habitat, noise levels and their proximity during denning, and other factors. We recommend that language be added to more accurately reflect the nature of the situation including the uncertainty regarding future activity levels and the effectiveness of Stipulations, ROPS, and other proposed mitigation measures; at minimum, the word "likely" should be placed between the words "would" and "be" in the third sentence. ***(Comment No.* 197618-044)**

Response To: Comment 197618-044

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Table 2-3, Pane 2-82, Effects on Marine Mammals, Cumulative Effects: This section should be expanded to include discussion of potential impacts on polar bears from multiple sales within NPR-A, combined with ongoing activities at existing fields, proposed future lease sales and subsequent oil and gas development across the North Slope region. Cumulatively, these activities could result in habitat loss or disturbances to polar bears as their "human-free" areas are reduced. It should also mention environmental factors such as global climate change that could increase polar bear dependency on terrestrial areas, thereby subjecting them to increased bear-human interactions. Effects are unknown and will depend on the level of oil and gas activity and polar bear abundance along the coast, and environmental and other factors. The authors also should provide a citation for the sentence, "...less than 10 polar bears will be oiled" and explain how this number was derived. ***(Comment No.* 197618-045)**

The Final IAP/EIS has been revised in consideration of your comments. Information was added to Section 4.6.9.9 Mammals, Effects on Marine Mammals, Cumulative Effects, Effects of Global Warming in the EIS on the potential for global climate changes to increase the dependency of polar bears on terrestrial habitats, and increasing the chances of human-bear interactions. Additionally, the comment, "...less than 10 polar bears will be oiled" was deleted from the EIS.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

3.3.7.2, Page 3-55, Polar Bear, Paragraph 2: We recommend re-writing this paragraph as follows: "Polar bears are usually associated with the pack ice, although they may be seen on land or swimming in open water at considerable distances from the ice. During the fall open water period, polar bears commonly swim ashore and scavenge beached carcasses or the remains of bowhead whales taken by subsistence hunters (Kalxdorff and Proffitt 2003). The Beaufort

Sea coastline, as well as river drainages and bluffs along lakes throughout NPR-A, provide important areas used by polar bears for resting, feeding, denning, and seasonal movements. In the last decade, the numbers of polar bears occurring along coastal areas of the Beaufort Sea have been increasing (Stirling and Andriashek 1992, Amstrup and Gardner 1994, and Amstrup 2000). The reason for the increase in numbers of polar bears is unknown but may be related to ice conditions. The USFWS (Schliebe et. al in prep) recently compared the distance of the ice edge from shore (during fall months) with the numbers of polar bears observed on land. A significant correlation was found to exist: as distance to the ice edge increased, so did the numbers of bears observed on land. The potential for continued reduction in ice cover from global climate change could result in greater numbers of polar bears occurring along the coastline for protracted periods of time, thereby also increasing potential conflicts with human activity." **(Comment No. 197618-067)**

Response To: Comment 197618-067

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.2 Polar Bear in the EIS, "During the fall open water period, polar bears commonly swim ashore and scavenge beached carcasses or the remains of bowhead whales taken by subsistence hunters (Klaxdorff and Proffitt 2003). The Beaufort Sea coastline, as well as river drainages and bluffs along lakes throughout National Petroleum Reserve – Alaska, provide important areas used by polar bears for resting, feeding, denning, and seasonal movements. In the last decade, the numbers of polar bears occurring along coastal areas of the Beaufort Sea have been increasing (Stirling and Andriashek 1992, Amstrup and Gardner 1994, Amstrup 2000). The reason for the increase in numbers of polar bears is unknown but may be related to ice conditions. The USFWS (Schliebe et al. In Prep) recently compared the distance of the ice edge from shore (during fall months) with the numbers of polar bears observed on land. A significant correlation was found to exist: as distance to the ice edge increased, so did the numbers of bears observed on land. The potential for continued reduction in ice cover from global climate change could result in greater numbers of polar bears occurring along the coastline for protracted periods of time, thereby also increasing potential conflicts with human activity."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

3.3.7.2, Page 3-55, Polar Bear, Paragraph 3: We recommend adding the following sentence prior to the existing last sentence: "In the Planning Area, polar bears are known to have denned at or near Cape Simpson, Smith Bay, Lonely, Pogik Bay, Cape Halkett, Eskimo Islands, Atigaru Point, and the Colville River Delta." **(Comment No. 197618-068)**

Response To: Comment 197618-068

The Final IAP/EIS has been revised in consideration of your comments. The recommended information was added to

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Map 3-24: Several known polar bear den sites have been omitted from the map. We recommend contacting the Service's Marine Mammal Management office at (907) 786-3800 for a listing of current and historic den locations known to occur in and adjacent to the Northeast Planning Area. Polar bear sightings data for 2000-2003 along the coast of the Planning Area are also available. **(Comment No. 197618-071)**

Response To: Comment 197618-071

The Final IAP/EIS has been revised in consideration of your comments. Map 3-24 has been updated to include current and historic den locations in and adjacent to the NPR.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.3.9.2, Page 4-121, Effects From a Large Spill, Paragraph 3: Please replace this paragraph with the following text: "Polar bears are known to travel and den along the Colville River and would be most vulnerable during fall (open

water), winter, and spring months. Polar bears may be affected directly through contacting spilled oil or ingesting contaminated prey, or indirectly through loss of habitat or prey species. However, the low probability of a large scale oil spill combined with the likelihood of low numbers of bears occurring in the area indicates that population-level effects would likely be low, unless spilled oil traveled extensively into the marine environment, or aggregations of bears encountered oil." ***(Comment No.* 197618-074)**

Response To: Comment 197618-074

The Final IAP/EIS has been revised in consideration of your comments. The paragraph stated in the comment was added to Section 4.3.9.2 Effects from a Large Spill in the EIS.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.9.2, Page 4-215, Effects of Disturbances, Paragraph 3: We believe that, under the Preferred Alternative and despite the proposed ¾-mile coastal buffer, increased levels of exploratory drilling and development near the coast would increase the likelihood of displacing or attracting polar bears or causing den abandonment, and request that the first sentence of Paragraph 3 be restated accordingly. Also, please replace the last sentence in paragraph 3 with the following: "The effects of exploration activities, including disturbance and potential spills, would depend on the scale and duration of the activity and could affect some marine mammals. However, numbers of marine mammals in the planning area are likely to be low, and therefore significant effects at the population level are not expected.". ***(Comment No.* 197618-088)**

Response To: Comment 197618-088

The Final IAP/EIS has been revised in consideration of your comments. The following information from the comment was added to Section 4.4.9.2 Effects of Disturbances in the EIS, "..increased levels of exploratory drilling and development near the coast would increase the likelihood of displacing or attracting polar bears or causing den abandonment compared to the No Action Alternative." Additionally, following was added as the last sentence in this paragraph, "The effects of exploration activities, including disturbance and potential spills, would depend on the scale and duration of the activity and could affect some marine mammals. However, numbers of marine mammals in the Planning Area are likely to be low, and high effects to marine mammal populations would not be expected."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.9.2, Page 4-215, Effects of Disturbances, Paragraph 4: We disagree with the last sentence in paragraph 4, which states: "Onshore [exploratory] activities would affect local tundra habitats but would not likely affect individual marine mammals or populations." Individual polar bears may be affected by exploration activities. Of particular concern are winter seismic surveys which are a primary disturbance factor for denning polar bears. This section should reflect that seismic surveys in close proximity to polar bear dens may cause abandonment of maternity dens by polar bears, however, numbers of dens affected would likely be low. Also, mitigation measures (e.g. use of habitat classification system to identify den habitat, pre-activity FLIR reconnaissance flights, use of scent-trained dogs to locate/validate dens, one mile den buffer), incorporated through site-specific Letters of Authorization, would minimize the possibility of disturbance occurring. ***(Comment No.* 197618-089)**

Response To: Comment 197618-089

The Final IAP/EIS has been revised in consideration of your comments. The information from this comment was used to replace the existing information provided in the draft EIS in Section 4.4.9.2 Effects of Disturbances as follows," Individual polar bears could be affected by exploration activities. Seismic surveys in close proximity to polar

Comment From: USFWS Anchorage (Comment Letter No. 197619)

As the primary entity responsible for conservation of polar bears, the Service believes the No Action Alternative would

be most consistent with mandates set forth in the Marine Mammal Protection Act of 1972 and the 1973 International Agreement on the Conservation of Polar Bears. This Alternative would preclude oil and gas development in the majority of the coastal and near-coast inland habitats within the Planning Area. These areas are most likely to be used by polar bears for denning, feeding, and seasonal movements. Continued and permanent protection of these areas from oil and gas leasing would be the most effective of the three. **(Comment No. 197619-019)**

Response To: Comment 197619-019

Facility development is restricted within ¾ mile of the coast to protect polar and other important habitat. See stipulation K-6.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Alternatives presented with respect to minimizing potential impacts on polar bears. If, however, additional leasing is to occur, as proposed in the draft Preferred Alternative and Alternative C, our primary concerns for polar bears are: 1) disturbance to denning bears; 2) disturbance to feeding/resting bears during the open water period; 3) large-scale oil spills; and 4) cumulative effects from ongoing and future oil and gas development that would result in loss of polar bear habitats or that would preclude continued use of preferred habitats. **(Comment No. 197619-020)**

Response To: Comment 197619-020

The Final IAP/EIS has been revised in consideration of your comments. Additional information to address the potential impacts on polar bears from the sources listed in the comment have been added to Sections 4.7.6.9 Terrestrial Mammals, Impacts from Oil and Gas Development, Marine Mammals, Cumulative Analysis; Section 4.3.9.2 Marine Mammals, Oil and Gas Exploration and Development Activities, Effects of Spills; and 4.4.9.2 Marine Mammals, Oil and Gas Exploration and Development Activities, Effects of Disturbances.

TOPIC: MARINE MAMMALS

ISSUE: WHALES

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Changes in bowhead whale behavior and deflections from their migratory routes associated with shipping noise, offshore drilling, and seismic operations is well documented. The relevant scientific literature as summarized in Richardson et al. (1995). Richardson et al. (1995) states, "In general, bowheads react strongly and rather consistently to approaching vessels of a wide variety of types and sizes." Reaction distances of bowheads to drilling island activities were summarized by the National Research Council (2003), which reported that reaction distances ranged from 6 to 19 miles. Brewer et al., (1993) noted (p. 27): "It appears that when the whales were approximately 30 km west of the industrial activity [Kuvlum#1] and its associated ice conditions, they were again observed over a wider range of latitudes and maintained a dispersed pattern at least until they reached the Point Barrow area." Generally, the loudest sound sources from offshore drilling activities were generated by ships and icebreakers associated with the drilling operations.

Richardson et al. (2003) reported a statistically significant displacement of bowhead whales from Northstar Island when exposed to low intensity sounds from relatively small vessels working near the drilling island. They noted that the "southern edge of the migration corridor was slightly farther offshore at the noisiest times as compared with typical times." Displacements on the order of 1.4 to 2.1 miles in 2001, and 1.4 to 2.9 miles in 2002 were detected. The main sound source was from the small vessels in the area and not the drilling activities on the island itself. Should shipping along the Beaufort Sea coast increase as a result of NPR-A development, even the subtle effects on bowhead migratory behavior noted above could lead to a decrease in subsistence whale harvest success in the fall hunting communities of Barrow and Nuiqsut.

The tendency for bowheads to migrate closer to shore in light ice years versus heavy ice years in the mid-Beaufort Sea during autumn has been demonstrated in at least two publications (Moore et al., 2000; Treacy, 2003). McDonald and Richardson (2004) noted that the distribution of whales was strongly near shore in 2003. They estimated that roughly 75% of the population (e.g., ~7,800 bowheads) came within about 27 km (17 mi) of Northstar Island in fall 2003. Sea ice retreat over the last decade in the Beaufort Sea coupled with the behavioral response of bowheads to sea ice (i.e., closer to shore in light ice years) could lead to much higher exposure to nearshore shipping noise. This suggests that the restrictions in the migration normally associated with Pt. Barrow in spring are also occurring at times during the autumn migration near Prudhoe Bay (Zeh et al., 1993). These factors clearly will increase the interactions between migrating bowhead whales and ship traffic.
The above data and findings must be more fully integrated into BLM's analysis of the potential impacts of expanding NPR-A industrial activities and associated vessel traffic on bowhead whales and bowhead subsistence harvests. **(Comment No. 196407-034)**

Response To: Comment 196407-034

The Final IAP/EIS has been revised in consideration of your comments. Text was added to 4.6.9.10 Threatened and Endangered Species, Bowhead Whale section of the EIS.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

It is also essential that BLM's subsistence analysis recognize and analyze the potential that increased industrialization of the NPR-A, including development of coastal staging areas, heightened interest in adjacent offshore areas, and increased oil spill risks, might be perceived by the International Whaling Commission (IWC) to be placing increased pressure on the endangered bowhead whale population. The sense among our subsistence whalers who have participated in meetings of the IWC is that the organization, unable to directly control industrial activities, might reduce the Native subsistence harvest quota as a means of protecting the species. At its most recent July annual meeting in Sorrento, Italy the IWC accused oil companies of threatening the survival of an endangered population of whales. The IWC's scientific committee stated that noise, vessel traffic, and the potential for a catastrophic oil spill posed "an obvious threat" to the feeding grounds of the 100 remaining western Pacific gray whales. The full IWC passed a resolution endorsing the scientific committee's findings that the "onset of oil and gas development programmes is of particular concern with regard to the survival of this population". It is not unreasonable to expect a similar reaction if the IWC perceives a heightened threat to bowheads. **(Comment No. 196407-042)**

Response To: Comment 196407-042

The following text was added to Subsistence Cumulative Impacts: The International Whaling Commission (IWC) sets the quota for the number of bowhead whales that Alaska Eskimos may harvest. This quota is based on both the biological status of the bowhead stock as well as the documented Alaska Eskimo cultural and subsistence need for bowheads. It is likely that the IWC will perceive increased industrialization of the NPR-A, including development of coastal staging areas, heightened interest in adjacent offshore areas, and increased oil spill risks, as placing increased pressure on the endangered bowhead whale population. In response to concerns that noise, vessel traffic, and the potential for a catastrophic oil spill poses a threat to the feeding grounds of the western Pacific gray whales, the IWC has already passed a resolution that the onset of oil and gas development programs is of particular concern with regard to the survival of this population. As industrialization proceeds along the Alaska North Slope, it will increase noise, vessel traffic, and the potential for an oil spill in the Beaufort Sea. Because this area is the fall migration path and feeding grounds of the bowhead whale, it is likely that the IWC will seriously consider the effects of industrialization on the bowhead whale population. The IWC is unable to directly control industrial activities. However, the IWC does control the Alaska Eskimo subsistence harvest quota and could reduce this quota as a means of protecting the species confronted with the effects of increased industrialization. If the IWC considers the threat of industrialization large enough, it could reduce the Alaska bowhead quota to protect the stock. This quota reduction would have a serious subsistence and cultural effect on the Iñupiat communities of the North Slope as well as to the Iñupiat in other communities who receive maktak and whale meat through sharing.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-124, third full paragraph: the conclusion that it is unlikely that any impacts to bowhead whales would occur from exploration activities under the No Action Alternative is not supported by any meaningful analysis. The paragraph itself states that noise-producing aircraft and marine vessel traffic would be the most probable sources of disturbance to bowheads during exploration. It seems clear that in 2003 fall migrating bowheads were deflected from their traditional migratory route due to marine barge traffic associated with staging activities at Camp Lonely in support of exploration. It is unclear what effect this deflection had on the animals, but it cannot be said that it had no effect. ***(Comment No.* 196407-098)**

Response To: Comment 196407-098

The Final IAP/EIS has been revised in consideration of your comments. Additional analysis regarding noise producing vessels was added to section 4.3.10.2 Threatened and Endangered Species, Bowhead Whale Section of the EIS. Including the observation by Barrow whalers that barge traffic at Camp Lonely may have caused deflection of bowhead whales from their typical migratory route. We have also added a more detailed description of the Richardson et al. 2004 study of bowhead deflection around the Northstar development, which deals extensively with the issues of noise disturbance to bowhead whales.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

Furthermore, the 1998 mitigation measures do not address the likely and potentially extensive impacts to bowhead whales, the bowhead migration, and the Alaskan Eskimo bowhead whale subsistence hunt from oil and gas leasing under the 1998 Decision. Barge traffic associated with NPRA development has already been identified as a potential factor leading to an apparent deflection of the 2003 fall bowhead whale migration at Barrow. With warmer winters and the retreating ice pack, the fall bowhead migration is occurring closer to shore than has been observed in years of heavy ice cover. Thus, as work continues to ramp up on the NPRA, bowheads are increasingly likely to encounter NPRA-related boat traffic during their fall migration. In the absence of adequate mitigation, these encounters threaten the whales and the bowhead subsistence hunt. ***(Comment No.* 197605-009)**

Response To: Comment 197605-009

The Northeast 1998 ROD mitigation measures did not address your concerns, however, our proposed mitigation measure K-6 (Section 2.6.2.2, General Lease Stipulations and Required Operating Procedures) requires the lessee to consult with the AEWC, NSB, and the Nuiqsut Whaling Association prior to conducting open water activities to minimize impact to fall and spring subsistence whaling activities.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

In both the current DEIS and the 1998 IAPIEIS, BLM failed to adequately address the adverse impacts to the bowhead subsistence hunt that are certain to occur with onshore oil and gas development in the NPRA. In fact in Section 4.3.42.2 of the DEIS, BLM concludes that "the No Action Alternative would not likely affect marine mammals." This is a shocking conclusion that is directly contradicted by numerous findings of the current environmental analysis – e.g. "summer" barge traffic, which would transport equipment and supplies to staging areas along the coast . . . would likely occur in offshore waters of the Planning Area from mid-July through October" (coinciding with the bowhead migration, DEIS Section 4.3.8.2, p. 4-101); "under the cumulative case, bowhead whales could be exposed to increased disturbance" (DEIS Section 4.6.9.10, p. 4-394); "disturbance from noise produced by marine vessel traffic supporting oil and gas activities in the Planning Area could be unavoidable . . .increased barge traffic associated with development could also displace migrating whales" (DEIS Section 4.7.10, p. 4-422). Numerous other examples are available in the DEIS. ***(Comment No.* 197605-020)**

Response To: Comment 197605-020

As noted, the DEIS addresses the potential impacts of noise to marine mammals. There is no evidence that noise

from onshore oil and gas activities will propagate to bowhead whale habitat. Increased barge traffic to staging areas along the coast has the potential to increase disturbance to marine mammals, including bowhead whales. Bowheads would only be exposed to noise from these activities during times when the fall migration occurs unusually close to shore. However, any disturbance is likely to be short term and localized, and stipulations and ROPs associated with the timing of barge traffic will minimize the potential for disturbance to marine mammals, including bowheads. It is, therefore, unlikely that any impacts to the subsistence hunt will occur.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

Support for this "no impact" conclusion is further eroded by a direct review of relevant literature, which makes it clear that increases in vessel traffic during the Beaufort Sea open water season, in the absence of appropriate mitigation, in fact will adversely affect bowhead whales and our bowhead subsistence hunt. Changes in bowhead whale behavior and deflections to their migratory routes from shipping noise, offshore drilling, and seismic vessels is well documented in the scientific literature as summarized in Richardson et al. (1 995). Richardson, W. J., C.R. Green, Jr., C. I. Malme, and D.H. Thomson, 1995, Marine Mammals and Noise, Academic Press, New York. The authors conclude that "in general, bowheads react strongly and rather consistently to approaching vessels of a wide variety of types and sizes." ***(Comment No.* 197605-021)**

Response To: Comment 197605-021

The EIS describes potential impacts of increased vessel traffic associated with potential developments in the NE National Petroleum Reserve-Alaska. We indicate that some deflection of migrating whales is possible and increases with each successive alternative given that there may be increased development, greater numbers of staging bases and a greater likelihood of development along the coast. We have revised the text in the EIS to make these points more clear.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

Richardson et al. (2003) reported a statistically significant displacement of bowhead whales from Northstar Island when exposed to low intensity sounds from relatively small vessels working near the drilling island. Richardson and Thomson, 2003, "Monitoring of industrial sounds, seals, and bowhead whales near British Petroleum's (BP's) Northstar oil development, Alaskan Beaufort Sea, 1999-2003." Draft report submitted to BP Exploration, Anchorage, AK and National Marine Fisheries Service, Anchorage, AK. They noted that the "southern edge of the migration corridor was slightly farther offshore at the noisiest times as compared with typical times." Displacements on the order of 1.4 to 2.1 miles in 2001, and 1.4-2.9 miles in 2002 were detected. The main sound source was from the small vessels in the area and not the drilling activities on the island itself. Should shipping increase along the Beaufort Coast associated with NPRA development, even subtle effects on bowhead migratory behavior such as these could lead to a decrease in whale hunting success in the fall hunting communities of Barrow, Nuiqsut, and Kaktovik. ***(Comment No.* 197605-022)**

Response To: Comment 197605-022

Richardson et al. (2004) clarified and reanalyzed data from the 2003 report. They state "There was no indication of any large scale change in the migration corridor in 2001 or 2002 as compared to years before 2000, not withstanding the evidence of a slight offshore displacement (at least in 2001) of some whales at times when industrial sounds were the strongest." They further go on to state "In 2003 the main migration corridor was centered closer to shore and there was no obvious difference in the location of the corridor offshore of Northstar at higher vs. lower noise times." They report that there was a "Northstar effect" on the distribution of whale calls during the small percentage of the 2001 monitoring period when Northstar sounds were strongest. This was attributable to sounds from maneuvering vessels rather than Northstar Island itself. They state that a similar effect in 2002 is equivocal and indicate that the sound levels rarely extended as high as the values associated with the "displacement effect" in 2001. There was no evidence of a Northstar effect in 2003. As we state in the EIS increased traffic during whale migration may result in a temporary displacement of the southern edge of the migration corridor. We have also added some text to clarify the issues raised by your comment.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

In addition, the tendency for bowheads to migrate closer to shore in light ice years, compared with heavy ice years, in the mid-Beaufort Sea during autumn has been demonstrated in at least two publications. Moore, S.E. 2000, Variability of Cetacean distribution and habitat selection in the Alaskan Arctic. Autumn 1982-91 ., "Arctic," 53(4), pp. 448-460; Richardson and Thomson, 2003, supra. In Richardson and Thomson (2003), the authors noted that the bowhead migration was strongly distributed near shore in 2003. They estimated that roughly 75% of the population (e.g., -7,800 bowheads) came within about 27 km (17 mi) of North Star Island in fall 2003. Sea ice retreat over the last decade in the Beaufort Sea coupled with the behavioral response of bowheads to sea ice (i.e., closer to shore in light ice years) could lead to much higher exposure to near shore shipping traffic and noise. These factors clearly will increase the interactions between migrating bowhead whales and vessel traffic. **(Comment No. 197605-023)**

Response To: Comment 197605-023

The Final IAP/EIS has been revised in consideration of your comments.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

It is important to note, in this regard, that while the bowhead migration was unusually close to shore at Northstar in 2003, it was unusually far offshore when it reached Barrow. Virtually all whales sited by Barrow crews were 20 or more miles from shore, as compared with their typical average distance of approximately 10 miles from shore. Barge traffic, some of it associated with NPRA, was unusually heavy between Northstar and Barrow late in the 2003 open water season, raising the possibility that the combined effects of noise at Northstar and NPRA-related vessel noise from late-season barging operations to the west of Northstar could have been associated with a deflection of the migration in that year. **(Comment No. 197605-024)**

Response To: Comment 197605-024

The Final IAP/EIS has been revised in consideration of your comments. Additional analysis regarding noise producing vessels was added to section 4.3.10.2 Threatened and Endangered Species, Bowhead Whale Section of the EIS. Including the observation by Barrow whalers that barge traffic at camp lonely may have caused deflection of bowhead whales from their typical migratory route. We have also added a more detailed description of the Richardson et al. 2004 study of bowhead deflection around the Northstar development, which deals extensively with the issues of noise disturbance to bowhead whales to the cumulative effects section 4.7.9.10.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

BLM attempts to dismiss potential adverse impacts of bowhead whales and their habitat, especially in the cumulative case, by pointing out that the bowhead population appears to have been increasing in recent years. Far from using apparent population health as a basis for dismissing bowheads from the discussion of impacts to endangered species, BLM should be looking at factors likely to be contributing to this recovery and developing mitigation measures to ensure that such factors continue in effect. **(Comment No. 197605-053)**

Response To: Comment 197605-053

The factors that may be positively influencing the growth of the BCBS bowhead population are not known. It is beyond the scope of this EIS to identify those factors. Mitigation measures that reduce the potential for disturbance, and thereby reduce the potential for negative influences on population growth, are proposed.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

As discussed previously in these comments, increasing vessel traffic in the Beaufort Sea poses risks to bowhead whales. The most immediate risks are associated with vessel noise. However, if vessel traffic is permitted to multiply,

unregulated, in the Beaufort, collisions with and strikes from vessels could well become a serious hazard for these whales and a threat to the population's continued recovery. The dire circumstances of North Atlantic right whales presents a graphic and tragic example of the ravages vessel traffic can cause to right whale populations, including bowhead whales. See Knowlton, A.R., and Kraus, S.D. 2001. Mortality and serious injury of northern right whales (Eubalaena glacialis) in the western North Atlantic Ocean. In: "Right whales: Worldwide Status." Best, P.B., Bannister, J.L., Brownell, R.L., Jr., Donovan, G.P. Eds. J. Cetacean Res. Manage. Special Issue 2. Cambridge, p. 309; Kraus, S.D., Hamilton, P.K., Kenney, R.D., Knowlton, A.R., and Slay, C.K. 2001. Reproductive parameters of the North Atlantic right whale. In: "Right whales: Worldwide Status." Best, P.B., Bannister, J.L., Brownell, R.L., Jr., Donovan, G.P. Eds. J. Cetacean Res. Manage. Special Issue 2. Cambridge, p. 309. **(Comment No. 197605-054)**

Response To: Comment 197605-054

Right whales occur in an area with heavy shipping traffic. While it is correct that increased boat traffic in the Beaufort Sea will increase the likelihood of potential strikes of whales by boats it would require a very large increase in boat traffic to create a situation analogous to that of the right whale habitat. It is unlikely that boat traffic in the Beaufort Sea will increase to such an extent and the increase in boat traffic associated with the NENPRA will be small since it will involve onshore development.

TOPIC: MINING

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

The current Plan does not address mining and assessment of locatable minerals. **(Comment No. 196937-005)**

Response To: Comment 196937-005

The entire planning area is within the National Petroleum Reserve – Alaska; as such it is reserved and withdrawn from all forms of entry and disposition under the public land laws including the mining and mineral leasing laws and all other Acts by the Naval Petroleum Reserves Production Act of 1976, April 5 1976 (Public Law 94 – 258). In designating the area a Petroleum Reserve the Act authorized the Secretary to: 1) make dispositions of mineral materials pursuant to the Act of July 31, 1947; 2) grant rights-of-way, licenses and permits necessary to carry out "his" responsibilities under the Act; and 3) convey the surface of lands properly selected on or before December 18, 1975 by Native village corporations pursuant to the Alaska Native Claims Settlement Act. All other provisions of law heretofore enacted and actions heretofore taken reserving such lands as a Naval Petroleum Reserve shall remain in force and effect to the extent not inconsistent with this Act. The extent of this withdrawal is depicted on Map 1 – 1.

Regarding the mineral potential, this area of the state has a very low mineral potential for locatables, as shown by the BLM Alaska Minerals Information System (AMIS) and the U.S. Geological Survey (USGS) Alaska Resource Data Files (ARDF) data bases. If there is any potential at all for minerals those would be for coal; only AMIS has one location identified (Ikpikpuk River 0020120005) and Merritt and Clough's work with the Alaska Division of Geological and Geophysical Surveys (ADGGS) show an extensive coal deposit underlying the North Slope. There is no correlation with the deposits at Red Dog and Donlin Creek to the Northeast-NPRA, the mineral terrains and geology for each location are completely different.

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that the plan be reviewed by an experience geologist or mining engineer from the BLM minerals office as a team member, specifically charged with addressing minerals issues. **(Comment No. 196937-006)**

Response To: Comment 196937-006

There are no known locatable minerals within the planning area.

The plan has been reviewed by BLM geologists and no known locatable minerals were identified.
This is beyond the BLM responsibilities and authority. The USGS may volunteer a geologist to be on the planning team, but the BLM cannot require them to be on the team.

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that at least one geologist from the USGS Science Center be part of the plan review to assist in understanding the undiscovered mineral potential. ***(Comment No. 196937-007)***

Response To: Comment 196937-007

See response to comment 196937-006 under Mining

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that the Plan include an appendix bibliography of all known minerals and mining reports for the planning ***(Comment No. 196937-008)***

Response To: Comment 196937-008

The National Petroleum Reserve-Alaska has been closed to hardrock mining since its creation in 1923. The closure was reinforced in the legislation that transferred jurisdiction to the Department of the Interior in 1976 (42 U.S.C. section 6502. Opening the area to mineral entry at this time would require Congressional action through legislation and is beyond the scope of this IAP/EIS.

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that a mineral occurrence map be developed for the area and that this map be included in the Plan. This map should also show all locations where mining has occurred in the past. This information is available through the USGS. ***(Comment No. 196937-009)***

Response To: Comment 196937-009

See response to comment 196937-001 under Land Exchange

TOPIC: MONITORING FOR COMPLIANCE

Comment From: T.D. Kameron (Comment Letter No. 092949)

Should an action alternative be selected, I would like to have a copy of the monitoring plan for water and biological resources. I am interested in the documentation of mitigations being considered for use, including how the BLM will ensure these mitigations are being implemented and why these mitigations are considered effective, how they will be monitored, and what actions will be taken if monitoring show mitigations are not working. ***(Comment No. 092949-005)***

Response To: Comment 092949-005

We have added you to our mailing list.

Comment From: Veronica Estelle (Comment Letter No. 196456)

Specifically, and this addresses all wildlife and habitat concerns within the NPR-A as a whole, I was disappointed to see that there are no plans for continued monitoring of wildlife (including shorebirds) both during and after

development. Since some oil companies did conduct pre-impact assessments in the northeastern portion of the NPR-A (e.g. the Colville River area), it is only logical and sensible to require that they continue these both during and after development. Without continued monitoring there is absolutely no scientifically-defensible means by which to assess whether the oil development process is harmful to wildlife and various habitats within this area. It would be most prudent of the BLM as a public land management agency to ensure the public that all resources on our lands are being managed to the best of our ability. I cannot say that you have convinced me of this. Continuous monitoring and an adaptive management approach are the best ways to ensure that all populations of wildlife and their habitat are being cared for. Currently, I see no plans within your assessment documents for continuous monitoring, and no pledge to adapt on-going management plans as conditions change during oil development. ***(Comment No.* 196456-005)**

Response To: Comment 196456-005

The AO shall take such action, including monitoring, as he deems necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the Reserve consistent with the requirements of the NPRPA [43 CFR 2361.1 (a)]. Thus, by regulation, a monitoring plan will be required if necessary to meet the resource objective. Also, see response to comment 143335-004 and Chapter 2 Section 2.7 Monitoring.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-32. K-5e.6. See comments above concerning restrictions on flight altitudes within the Teshekpuk Lake Caribou Habitat Area and the conflict with BLM requirements for caribou monitoring. As currently written, monitoring studies could not be accomplished with these flight restrictions in place. ***(Comment No.* 196557-073)**

Response To: Comment 196557-073

Flight restrictions identified under stipulation K-5 are not intended to prevent necessary monitoring flights.

Comment From: Michael Graesser (Comment Letter No. 196946)

In addition to the above concerns, the National Research Council's report on the impact of industrial development within the NPR highlighted the lack of enough "benchmark" areas free from industrial presence. Such areas would be crucial for assessing the impact of industrial development within the NPR, allowing for a comparison of wildlife and flora between areas affected and unaffected by development. The TLSA with a 'no-lease' status could have such a research value. ***(Comment No.* 196946-008)**

Response To: Comment 196946-008

Under the Preferred alternative, approximately 213,000 acres would be unavailable for oil and gas leasing. This area could be studied to compare areas affected and unaffected by development. Based on the analysis of affects in Chapter 4, only about 6 percent of the Planning Area is likely to be directly or indirectly impacted by development. Thus, nearly all land within the Planning Area would be available to serve as a "benchmark" area free of industrial disturbance.

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

Neither does BLM recognize that the Reserve is already undergoing significant change. As a result, the SEIS erroneously leaves no permanently protected areas that scientists can use to set ecological benchmarks. It will not be possible to discern the effects of development, climate warming and other problems and changes, absent areas free of industrial influence. ***(Comment No.* 197614-013)**

Response To: Comment 197614-013

North of the Brooks Range portions of Gates of the Arctic National Park and Preserve, the Arctic National Wildlife

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

Monitoring of resources and activities within the NE Plan Area has been very limited with no coordination with the RMT. The BLM must describe how they met the monitoring commitments documented in the 1998 FEIS and ROD and how these will be continued in the fixture. Absent the XMT, BLM must detail how it intends to conduct long term monitoring that includes biological control areas within the NE Plan Area. ***(Comment No. 197614-027)***

Response To: Comment 197614-027

Performance-based mitigation would be most effective after a concise and comprehensive research and monitoring protocol is developed and implemented. The Research and Monitoring Team (RMT) was re-established and tasked with developing a monitoring plan for Northeast NPR-A this group is proceeding to develop such a plan. We also believe these mitigations would provide the flexibility needed to require such alterations in facility design and operations if significant impacts are identified, utilizing the appropriate environmental reviews, which may not be a major NEPA action.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

We also have our misgivings about whether the BLM will actually perform fully the monitoring activities in the NPR-A that it concedes are necessary to make sure, after the fact, that performance-based mitigation had worked. Sure, the Amended Draft EIS says over and over again that the "BLM is committed to directing the necessary resources to this on-going monitoring requirement."94 Of course, Congress, not the BLM decides the level of BLM funding, and in this time of increasing federal budget deficits and with an administration in place that promises smaller, more business-friendly government, the BLM can hardly guarantee that it will receive the additional funding to carry out these blithely offered promises of future increases in monitoring efforts. ***(Comment No. 197616-101)***

Response To: Comment 197616-101

Monitoring efforts are not intended as a substitute for incorporating mitigation measures on land-use authorizations, rather monitoring is used to ensure compliance with the terms of the authorization and to assess the effectiveness of protective measures. This is also the current situation as are budget uncertainties. Also see response to comment 197616-099 under Stipulations and ROPs

Comment From: Environmental Coalition (Comment Letter No. 197617)

While claiming that ROPs will be adequate because they will be supported by "rigorous monitoring," see draft IAP/EIS at 2-11, the draft IAP/EIS acknowledges the collapse of the role Research Monitoring Team ("RMT"). The RMT was, under the 1998 ROD, to play a key role in assuring that the Reserve's resources would be adequately monitored and protected. See 1998 ROD at 21 ("The Research and Monitoring Team will help guide the monitoring effort in the planning areas."); see also 1998 IAP/EIS at iv ("Through the use of stipulations, leasing would be conducted in a manner that is consistent with the protection of the surface resources, including requiring ... creation of an Interagency Research and Monitoring Team ... [that] would coordinate research and monitoring efforts related to the effectiveness of stipulations and surface resource impacts.") In fact, the RMT was never constituted in an effectual manner and never did any research or monitoring. Id. at 1-15. BLM must disclose this fact and explain its impacts to the public and decision maker in any final Amended EIS. Equally important, BLM must justify adopting an entirely different approach to mitigation in light of the fact that no organized or "guided" research and monitoring of the effectiveness of the 1998 ROD's Stipulations has been done to show that the new approach will necessarily lead to better environmental protection for the Reserve's natural resources. ***(Comment No. 197617-170)***

Response To: Comment 197617-170

The Research and Monitoring Team (RMT) was re-established and tasked with developing a monitoring plan for Northeast NPR-A. This group is proceeding to develop such a plan.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.7, Page 2-33, Monitoring: Monitoring of other wildlife species should also be conducted to ensure that these populations are not adversely affected by oil and gas development. Several ongoing and proposed monitoring efforts include predators of bird species, but no emphasis has been placed on monitoring bird productivity and survival, two population parameters thought to be negatively affected by higher predator numbers around development sites. ***(Comment No. 197618-037)***

Response To: Comment 197618-037

List of monitoring activities in Chapter 2 section 2.7 is meant as a list of examples and is not intended to be all inclusive.

Comment From: Arnold Brower Jr. (Comment Letter No. 197986)

First of all, in your EIS -- and my comments here will be brief -- is that in your proposed actions I would like to see a -- since we're talking about ANILCA's 810 subsistence issue, is that perhaps that the Bureau of Land Management can work together with the Inupiat Community of Arctic Slope to develop a conflict avoidance agreement. In this conflict avoidance agreement, we will institute a monitoring person, a Native monitoring person who will be working with any contractor, whether it be seismic or drilling, to ensure that the environmental portions are reported to the Inupiat Community of Arctic Slope and then a similar report be made to the community of Atqasuk. This will be a very healthy position for Bureau of Land Management, to enter into a conflict avoidance agreement with the user agents of the Inupiat Community of Arctic Slope. ***(Comment No. 197986-226)***

Response To: Comment 197986-226

The BLM is currently developing a position to serve the needs of the North Slope Borough Communities in addressing issues/topics of concern regarding land use management decisions in the National Petroleum Reserve-Alaska.

Comment From: Arnold Brower Jr. (Comment Letter No. 197988)

So this -- this is -- for these reasons, those comments I stated in Atqasuk, to implement a conflict avoidance agreement with the ICAS so that every lease holder would have to come up with -- in your Plan, to come up with a conflict avoidance agreement with the impacted community, whether it be Native Village of Barrow, ICAS -- that's who it has to be a contract with, to ensure monitoring -- Inupiaq monitoring agents, personnel that will monitor the activity of the exploration or drilling or both, or any of that kind of activity pertaining to the current leasing program in the National Petroleum Reserve, NPR-A East, including potentially the west, but at this point, northeast quarter. ***(Comment No. 197988-200)***

Response To: Comment 197988-200

Please see response to comment 197986-226 under Monitoring for Compliance.

Comment From: Rosemary Ahtuangaruak (Comment Letter No. 197990)

And it's very important to us that monitoring occurs, that we're involved in the monitoring, that our community members are taught and trained and able to be educated and be eligible to be employed in these activities, for us to support our families in our village. We're the closest community to these activities. We have not succeeded in having the most beneficial jobs and providing for our families year-round. We have very seasonal jobs and that makes it very difficult to retain our houses and pay our bills. That creates a lot of stress and strain in our families. And it's important that we reduce those changes, to keep our families, to be strong and continue into the future as we want to do. ***(Comment No. 197990-080)***

Response To: Comment 197990-080

ROP H-1 requires development the monitoring plan in consultation with local, knowledgeable subsistence users in the form of the Subsistence Advisory Panel.

Comment From: Frederick Tukle (Comment Letter No. 197990)

The issue from ICAS is that BLM should supplement the ICAS PL 93-638 contract to monitor and work with BLM and oil and gas companies, that the Inupiat should be monitoring the work during the winter for EPA and subsistence resource information that will be valuable for us to report affected renewable resources and subsistence hunters while in the subsistence arena of Nuiqsut and Barrow, but not limited to these villages. The request is for 65,000 for staff persons for ICAS and at least two monitoring agents who are ICAS members on every company doing work with NPR-A. This way we will keep a record of activities that will and may have delayed effects on our hunting area per each species that may be and will be affected by virtue of displacement or alteration of land, et cetera. ***(Comment No. 197990-121)***

Response To: Comment 197990-121

See response to comment 197986-226 under Monitoring for Compliance

TOPIC: MONITORING FOR COMPLIANCE

ISSUE: PERFORMANCE VS. PRESCRIPTED

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Fourth, a performance-based mitigation system requires a long-term commitment to fund research, monitoring, and enforcement. Performance-based mitigation can only work if there is a clear requirement for long-term comprehensive research and monitoring to establish baseline data and impacts associated with industrial operations. As discussed above, there must also be the ability to require significant alterations in industrial facilities and operations if significant impacts are identified. As we have noted before, we see it as a significant failing by BLM that far more effort and money has not been spent collecting both baseline and impact information within the Northeast Planning Area since the first planning process was concluded in 1998. It was well known then that industry had great interest in the region. It was well documented that the area is critical to a variety of resources and to subsistence users. The Research and Monitoring Team (RMT) created subsequent to adoption of the 1998 Plan made recommendations and money was spent, but it took far too long for BLM to accept and act on those recommendations. ***(Comment No. 196407-016)***

Response To: Comment 196407-016

See response to comment 197614-027 under Monitoring for Compliance

TOPIC: NEPA PROCESS

Comment From: Ted von Hippel, Ph.D. (Comment Letter No. 000039)

The comment period is too short. Given the detailed proposals put forward by BLM, and given that summer is a more difficult time to get the attention and time of Alaskans, more time should be available for thoughtful analysis. I suggest 90 days. ***(Comment No. 000039-006)***

Response To: Comment 000039-006

In response to public requests for more time to comment on the Draft IAP/EIS, the close of the public comment period was extended from August 2 to August 23, for a total of 75 days.

Comment From: John Strasenburgh (Comment Letter No. 185987)

I have read many of the public comments from last Fall's Anchorage, Nuiqsut, and Barrow scoping meetings. I found particularly compelling those comments from Geoff Carroll, Alaska Fish and Game area biologist, George Ahmagoak, North Slope Borough Mayor, Mary Hicks, and John Schoen, Audubon Alaska scientist. These and all other public comments, except those of resource development organizations or companies having a financial interest in the outcome, have been virtually ignored in your draft preferred alternative. ***(Comment No.* 185987-004)**

Response To: Comment 185987-004

Scoping is specifically intended to give stakeholders and the public an opportunity to have input on the issues, alternatives, and mitigation measures considered in the IAP/EIS. Although the individual responses to comments received during scoping are not prepared, in a sense the Draft IAP/EIS is the "reply" to the scoping comments. Which issues, alternatives, and mitigation measures were to be fully analyze in the IAP/EIS was decided with the consideration of all of the scoping comments. The analyses in the Draft IAP/EIS were prepared with consideration of all of the scoping comments.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Further, if a hydrocarbon accumulation is found, and if it is found in commercial quantities and proposed for development, NEPA requires a detailed site-specific analysis of the proposed project, complete with recommended mitigation measures to minimize adverse impacts to wildlife resources and traditional land use. It is at this stage where "site-specific" stipulations beyond what is being proposed by the BLM in this EIS would be developed. The ongoing operations of CPAI in the Petroleum Reserve have clearly demonstrated our ability to explore and develop new opportunities on the North Slope while minimizing any impact on the environment, traditional subsistence activities or cultural resources. ***(Comment No.* 196557-028)**

Response To: Comment 196557-028

This is correct. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The deficiencies are so extensive that if the BLM insists on pressing forward with this NEPA process, it should correct the deficiencies in the Amended Draft EIS and make a revised Amended Draft EIS available for public comment. The version of the Amended Draft EIS that we are commenting on is simply too incomplete for the public to provide meaningful comments. ***(Comment No.* 197616-011)**

Response To: Comment 197616-011

The Final IAP/EIS has been revised as needed in response to comments received on the Draft IAP/EIS. Deficiencies specifically identified during the public comment period have been corrected. Comments received on the Final IAP/EIS during the period (at least 30 days) before publication of the Record of Decision will be considered by BLM in

the decision.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

In addition, this focus on justifications which have since been dropped, while others have been added, improperly distorts the NEPA process. The justifications urged by the BLM are what people focused on during the scoping process, not the policy recommendations from the NEPDG. We certainly took Mr. Bisson's statement and ones similar to it seriously in our scoping letter and in this letter. We examined and addressed every justification and authority urged by BLM in our scoping letter55 and in this letter. We and most other individuals and organizations commenting during this process do not have full time staff available for these issues. To the extent that this misdirection wastes limited resources, it improperly harms both the efficiency and the effectiveness of the public process that is at the very core of NEPA. ***(Comment No.* 197616-064)**

Response To: Comment 197616-064

The comments made in a September 5, 2003 press release announcing scoping procedures were not intended as a justification for amending the Northeast 1998 ROD. Given the direction from the Presidents' National Energy Development Policy Group to consider additional environmentally responsible oil and gas development based on sound science and best available technology through further lease sales in the National Petroleum Reserve-Alaska, the State Director's comments were intended as assurance that the BLM through the NEPA process believes that we could comply with the direction of the Presidents' NEDPG and at the same time protect important surface and subsistence resources. BLM does believe there have been important changes that would allow industry to conduct oil and gas activities in a environmental responsible way to protect resources in the areas unavailable for leasing in the 1998 ROD.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

It is very clear that the opposition of the Inupiat people and the local residents of Nuiqsut and the North Slope to the BLM's proposals is virtually unanimous. In our local discussions, it would be hard to find a single resident of Nuiqsut who supports what BLM is proposing to do. The BLM seems determined to ignore the opposition of the people whose lives and culture are most connected with the lands involved and who would be most affected by these actions. That the lands that BLM is so managing are entirely lands that are the birthright and heritage of our people and provide us our daily sustenance makes these actions even more offensive to us. This approach is even more inexplicable after the generally positive experiences that the community had dealing with the BLM during the collaborative process used to reach the current management plan.65 ***(Comment No.* 197616-071)**

Response To: Comment 197616-071

The BLM has tried very hard during this planning process to involve local residents through open house, government to government and tribal consultation meetings, and is aware of local concerns regarding oil and gas development in the Petroleum Reserve. We believe that we have provided the necessary protections to avoid serious impacts to a traditional subsistence lifestyle. We continue to take our responsibility in this arena very seriously and will continue to seek the input of the citizens of the North Slope of Alaska.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Right off the bat, pre-ordained EIS results such as those demonstrated by these quotes are impermissible under federal law. Under federal regulations, "Environmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made." 40 CFR 1502.1. ***(Comment No.* 197616-079)**

Response To: Comment 197616-079

The BLM has not made any decision to change the current prescriptive-based stipulations and ROPs in the Northeast National Petroleum Reserve-Alaska (Petroleum Reserve). In consideration of recent operational experiences in the National Petroleum Reserve-Alaska and the analysis of the performance-based measures in the Northwest Petroleum Reserve IAP/EIS, BLM believes it is an appropriate time to reconsider the stipulations and ROPs in the National Petroleum Reserve-Alaska and has made a decision to study and consider such a change via this NEPA process. The BLM considers Alternative A (No Action Alternative) a fully viable option. The BLM will consider your comments in making the decision at the end of this NEPA process about whether to make changes to the Northeast National Petroleum Reserve-Alaska stipulations. The decision will be documented in the Record of Decision.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

NEPA requires the exploration and objective evaluation of reasonable alternatives.73 Section 810 of ANILCA also requires the consideration of alternatives.74 That's alternatives - plural. The BLM has already decided that performance-based measures will be implemented in the Northeast NPR-A, and it has confined its planning process to only developing performance-based measures. How then can there be alternative mitigation packages that are considered and analyzed in the Amended Draft EIS or the Section 810 analysis? Cramming an already-made decision through this process by narrowly defining the decision to be made and then providing only one alternative that is consistent with that decision is not in compliance with the letter or the spirit of NEPA or ANILCA. See e.g. State of Wyoming v. United States Department of Agriculture, 277 F.Supp.2d 1197, 1122 (D. Wyo. 2003). See also International Snowmobile Manufacturers Assoc. v. State of Wyoming, 2004 U.S. LEXIS 1796 (D. Wyo. Feb. 10, 2004)(prejudged political decision coupled with the lack of a hard look in the Final EIS leads to the conclusion that there is a substantial likelihood that agency decision is arbitrary and capricious.) **(Comment No. 197616-081)**

Response To: Comment 197616-081

Under NEPA, we must "rigorously explore and objectively evaluate all reasonable alternatives." A reasonable alternative must meet the proposal objectives. When there is a potentially very large number of alternatives, only a reasonable number (a range of alternatives) covering the full spectrum of alternatives must be analyzed and compared in the EIS (Question 2a of CEQ's Forty Most Asked Questions). The BLM believes that the Draft IAP/EIS presents and analyzes a full range of reasonable alternatives. The BLM has not made any decision to change the current prescriptive-based stipulations and ROPs in the Northeast National Petroleum Reserve-Alaska. The BLM has only made a decision to study and consider such a change. If such a decision were to be made at the end of this NEPA process, it would be documented in the Record of Decision. The performance-based stipulations and ROPs are analyzed for two alternatives in the Draft IAP/EIS - Alternatives B and C. The development and refinement of measures to protect the physical, biological, and human environment is an ongoing process that does not end with this NEPA process or with adoption of an Integrated Activity Plan. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted.

This comment (197616-081) also has a response under topic ANILCA.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

A draft EIS is supposed to be as complete as possible. The Amended Draft EIS is clearly not as complete as possible since it effectively writes-off the No Action Alternative just because it is not consistent with the BLM's pre-ordained decision and because alternative leasing scenarios are not explored. When a draft EIS is incomplete and deficient "so as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion."79 A failure to include an adequate range of alternatives is precisely the type of deficiency where a second opportunity for public comment should be provided after the revisions are made. Additionally, since the decision to

implement performance-based ROPs and stipulations has already been made, the revision of the Amended Draft EIS needs to consider more than one performance-based alternative. **(Comment No. 197616-086)**

Response To: Comment 197616-086

When there is a potentially very large number of alternatives, only a reasonable number (a range of alternatives) covering the full spectrum of alternatives must be analyzed and compared in the EIS (Question 2a of CEQ's Forty Most Asked Questions). The BLM believes that the Draft IAP/EIS presents and analyzes a full range of reasonable alternatives. The analysis of Alternative A (No Action Alternative) and the prescriptive-based stipulations and ROPs tiers off of the analysis in the 1998 Northeast National Petroleum Reserve-Alaska Final IAP/EIS and that analysis is incorporated by reference in this document. The BLM has not made any decision to change the current prescriptive-based stipulations and ROPs in the Northeast National Petroleum Reserve-Alaska. The BLM has only made a decision to study and consider such a change. If such a decision were to be made at the end of this NEPA process, it would be documented in the Record of Decision. The performance-based stipulations and ROPs are analyzed for both Alternatives B and C and most were also analyzed in the 2003 Northwest National Petroleum Reserve-Alaska IAP/EIS.

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM has impermissibly rejected consideration of reasonable alternatives as required by NEPA. None of the draft IAP/EIS alternatives provide adequate and appropriate protection for the unique cultural, natural, fish and wildlife, scenic and historical values as expressly required by Congress in the National Petroleum Reserve Production Act of 1976. At a minimum, BLM must consider alternatives B and C from the 1998 Northeast IAP/EIS as well as an alternative that includes permanent protection for the Teshekpuk Lake Special Area, Colville River Special Area and other biological hot spots in the Northeast Planning Area. These alternatives are more consistent with the purpose of fulfilling BLM's management responsibilities and responding to Congressional and Presidential directives than the alternatives BLM included in the draft IAP/EIS. **(Comment No. 197617-006)**

Response To: Comment 197617-006

Under NEPA, we must "rigorously explore and objectively evaluate all reasonable alternatives." A reasonable alternative must meet the proposal objectives. When there is a potentially very large number of alternatives, only a reasonable number (a range of alternatives) covering the full spectrum of alternatives must be analyzed and compared in the EIS (Question 2a of CEQ's Forty Most Asked Questions). The BLM believes that the draft EIS presents and analyzes a full range of reasonable alternatives. The development and refinement of measures to protect unique cultural, natural, fish and wildlife, and scenic and historical values is an ongoing process that does not end with this NEPA process or with adoption of an Integrated Activity Plan. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal- and project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS fails to identify adequately the sources relied upon. An EIS "shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement." 40 C.F.R. § 1502.24. Throughout the Environmental Consequences chapter, the draft IAP/EIS reaches conclusions asserting no, negligible, minor or insignificant impacts to resources without identifying the sources relied upon for the particular conclusions it reaches. This violates 40 C.F.R. § 1502.24. It is not enough that an EIS contain a Bibliography. The text of the EIS must direct the reader to the sources in the Bibliography upon which the EIS relies in analyzing impacts and reaching conclusions about them. **(Comment No. 197617-008)**

Response To: Comment 197617-008

As noted in 40CFR 1502.24, agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement. Where possible, a quantitative assessment of impacts has been provided (e.g., number of acres impacted) and time frame in which the impact would likely occur (short-term or long-term). For impacts that cannot be quantified, the relative magnitude of impacts were provided based on criteria identified in Section 4.1.1. These criteria have been designed to reflect (1) the context and the intensity of the effect, as defined in CEQ Regulations (40 CFR 1508.27), (2) legal or regulatory limits or requirements, and (3), the effectiveness of stipulations and ROPs to mitigate for adverse impacts. Sources of information used to develop conclusions have been included with discussions of resource impacts, supported by the judgment of professionals who are familiar with resource issues and types and magnitudes of impacts that could occur under the alternatives.

Comment From: Environmental Coalition (Comment Letter No. 197617)

NEPA requires that, "to the fullest extent possible," agencies must "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."42 U.S.C. 4332(2)(E)(2000). To fulfill this requirement, the agency must prepare an EIS that "rigorously explore(s) and objectively evaluate(s) all reasonable alternatives" to the proposed action. 40 C.F.R. 1502 14(a). Because the consideration of an appropriate range of alternatives is so important to the NEPA process "the existence of a viable but unexamined alternative renders an environmental impact statement inadequate." Resources Limited Inc. v. Roberston, 35 F.3d 1300, 1307 (9th Cir.1993). In the five years since the release of the 1998 IAP/EIS and ROD, we have accumulated additional information and analyses that require BLM to be more restrictive and protective in the Northeast Planning Area, not less. Despite the growing environmental and social concerns documented in The National Academy of Sciences National Research Council report Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope, millions of additional acres have been made available to the oil and gas industry on the North Slope without any additional environmental protections. **(Comment No. 197617-035)**

Response To: Comment 197617-035

Under NEPA, we must "rigorously explore and objectively evaluate all reasonable alternatives." A reasonable alternative must meet the proposal objectives. When there is a potentially very large number of alternatives, only a reasonable number (a range of alternatives) covering the full spectrum of alternatives must be analyzed and compared in the EIS (Question 2a of CEQ's Forty Most Asked Questions). The BLM believes that the draft EIS presents and analyzes a full range of reasonable alternatives. If you can provide us with the referenced "additional information and analyses that require BLM to be more restrictive and protective in the Northeast Planning Area," we will consider it in making decisions at the end of this NEPA process. The information and conclusions in the NRC (2003) report are considered in the Draft IAP/EIS analysis. The development and refinement of measures to protect unique cultural, natural, fish and wildlife, and scenic and historical values is an ongoing process that does not end with this NEPA process or with adoption of an Integrated Activity Plan. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal- and project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS for the Northeast Planning Area is not site-specific. A generic discussion of resources and potential impacts like that contained in the draft IAP/EIS simply cannot suffice as the required site-specific analysis. Under different circumstances the broad-scale approach that BLM has taken in the draft Amended IAP/EIS might possibly be acceptable in a programmatic EIS, if the programmatic EIS does not purport to become the basis for

authorization of discrete activities, such as oil and gas leasing, in particular areas of the Reserve. This draft IAP/EIS, however, does not claim to be a programmatic EIS, but forms the basis for a leasing program. Based on this NEPA process, BLM will issue leases that authorize oil and gas exploration and development. Accordingly, the choice among alternatives will have direct, on-the-ground impacts that must be considered on a site-specific basis. The draft IAP/EIS will establish the lease stipulations and ROPs that are intended to protect surface resources when exploration and development occur. Decisions such as these will impact the environmental and subsistence resources directly and, therefore, must be considered on a site-specific basis. ***(Comment No.* 197617-038)**

Response To: Comment 197617-038

The Draft Amendment IAP/EIS (DEIS) fully satisfies the project-specificity requirement of NEPA. Chapter 3, Description of the Environment, of the DEIS provides detailed, project-specific information about the environment that would be affected by the various alternatives, including the physical, biological, socio-economic and cultural resources in the planning area. Summarizing existing scientific studies and surveys conducted on each resource in the planning area, Chapter 3 and its accompanying maps presents in-depth information regarding the different soil and vegetation types and their locations, climate, air quality and surface and ground water resources in the planning area. Detailed scientific information is also provided regarding the various fish, bird, marine and terrestrial mammal, and endangered and threatened species, their known locations, the time of year present and their concentrations in the planning area during the year and during different life stages. For example, the DEIS discusses prime molting, nesting and brood0rearing areas for birds; calving, insect relief and wintering areas for caribou; and polar bear denning sites; etc. Human communities, their socio-economic and ethnic composition, uses of the land, transportation corridors and the importance of subsistence in the planning area are also described and illustrated on maps. Specific information about known historic, paleontological and cultural resources of the planning area is discussed, as well as information about wild and scenic rivers and the varied scenic, visual, recreational and wilderness resources in the planning area. Information received from public comments on the DEIS has been incorporated into the Final Amended IAP/EIS where appropriate. The project-specific information in Chapter 3 provides the basis for the detailed and analysis of direct, indirect, and cumulative environmental impacts in Chapter 4. In Chapter 4, reasonable exploration and development scenarios are described in detail for each alternative. These scenarios are based on known information about the oil and gas potential of the planning area and existing industry technology. The scenarios used in the DEIS are the same kinds of scenarios utilized in the final 1998 Northeast IAP/EIS and commonly used in many places by

Comment From: Environmental Coalition (Comment Letter No. 197617)

C. INADEQUATE DESCRIPTION OF OIL AND GAS EXPLORATION AND DEVELOPMENT As discussed above, a hypothetical development scenario not tied to particular locations cannot serve as the basis for a NEPA required site specific analysis. Furthermore, BLM's hypothetical development scenario is incomplete and unrealistic when evaluated in the context of existing development in the region. As a result, the nature and extent of potential impacts are significantly understated. The draft IAP/EIS fails to describe adequately potential scenarios for oil field exploration and production activities and infrastructure. The requisite analysis necessary to authorize exploration and development leases is not provided. Indeed, BLM concedes that development is described only in a general sense (draft IAP/EIS at 4-10) ***(Comment No.* 197617-041)**

Response To: Comment 197617-041

As acknowledged in the Draft IAP/EIS, the environmental analysis is based on hypothetical scenarios that are conceptual views of possible future activities. It is difficult to accurately predict events decades into the future. Most competent analysts accept (and deal with) the uncertainties associated with incomplete information and projections of trends into the future. The scenarios are largely built on projections of existing technology and trends, and the BLM believes that is a logical basis for analysis. The scenarios offered in this document are reasonable views of the future based on current information, and the scenarios have varying degrees of uncertainty given the set of assumptions (such as the value of oil or the timing of proposed activities) for each. In this largely untested area, no one can predict exactly where promising geologic structures would occur and be tested, or where new commercial oil discoveries would be made. The descriptions of typical individual exploration and development activities are based on current practices. The Draft IAP/EIS evaluates the potential impacts from typical activities as they might occur at

any location in the Northeast Planning Area of the National Petroleum Reserve-Alaska. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling before any decision on whether to approve proposed activities. Further, if commercial discoveries are identified, the lessee must submit proposals for development activities to BLM for consideration for approval. The BLM would again prepare a detailed project-specific environmental analyses of proposed development activities before any decision on whether to approve proposed activities.

Comment From: Delbert Rexford (Comment Letter No. 197974)

In closing, if there is going to be an alternative selected from the prospective Inupiat Community of the Arctic Slope, the 79 stipulations, Assemblyman Hugo has noted in his comments are supported by Inupiat Community of the Arctic Slope. I would like to further reiterate that in 1985 when I went to Houston and met with the National Outer Continental Shelf Policy Committee, we had made recommendations in 1985 -- excuse me, 1995, so that those impact funds can come directly to impacted communities; specifically, the tribes in the communities that are impacted. And yet BLM in the name of national security, in the name of providing domestic oil, continues to ignore these pleas for financial benefits by the indigenous community. **(Comment No. 197974-164)**

Response To: Comment 197974-164

See response to comment 197638-007 under Impact Compensation

Comment From: Sara Chapell (Comment Letter No. 197975)

I would like to just say a few words about the public process the BLM has been moving forward with so far. This truncated public comment period amidst what I would consider hurried public hearings and the limited ability for the people to see, learn about and understand the draft document may fulfill your minimal legal requirements, but is not what we should expect from the agency who has been entrusted with the management of these extraordinary lands. The public deserves more, and at the very minimum should be given into the fall to read and comment on these recommendations. **(Comment No. 197975-119)**

Response To: Comment 197975-119

The comment period on the DEIS was originally to end on August 2, however, the BLM extended that to comment period to August 23. The total number of days was thus increased to a total of 76 days. The comment period started on June 9, 2004.

Comment From: Charles Brower (Comment Letter No. 197980)

North Slope governments, groups, and residents were not appropriately consulted before the intent to consider this proposed amendment was announced. We have not been appropriately consulted as it has been prepared. Consultation must be meaningful, prolonged, and take place in North Slope communities. **(Comment No. 197980-015)**

Response To: Comment 197980-015

The BLM has had numerous meetings, both with member of the North Slope Communities, as well as the North Slope Borough officials regarding the consideration of amending the 1998 ROD. For example, early on in this process (December 2003) the BLM conducted a workshop in Anchorage to describe and develop ROPs and lease stipulations to be considered for use in the Northeast Planning Area. There were attendees from the Nuiqsut, Barrow, Anchorage, and Fairbanks and the groups and individuals in attendance are listed in Chapter 5. Another meeting was held in Nuiqsut and Barrow following the Anchorage meeting to continue to develop mitigations for consideration during this amendment process prior to the draft. Please see Chapter 5 for a complete description of the Consultation process that has taken place during this process.

Comment From: Myron P. Naneng, Sr. (Comment Letter No. 197982)

AVCP has been involved in migratory bird co-management and conservation for over twenty years. Migratory birds are a critical part of our people's subsistence and culture. Black brant, in particular, have been a species of concern here on the Y-K Delta, which AVCP and our villages have been active in co-managing for conservation. We are concerned that the possible opening of the Teshekpuk Lake area to oil exploration and development might adversely affects black brant populations here on the Delta. Banding studies suggest that nearly 70% of the black brant in the Teshekpuk Lake area may be brant that nest here in the y-K Delta. In 1998, the Teshekpuk Lake Special Area was omitted from the remainder of the Northeast Planning Area when the remainder of the Planning Area ws opened to the oil industry, specifically because of its ecological value. Planning Area was opened to the oil industry, specifically because of its ecological value. We therefore request that a hearing be held in Bethel on this decision to revisit the 1998 plan. For our part, we will do all that we can to ensure that people in our coastal villages get word of this meeting, and have n opportunity to comment at such a hearing, although we believe it would also be important for BLM to widely publicize such a meeting in the region's newspapers and radio station, and to accommodate toll free callings from the villages. We would also suggest that BLM hold at least one hearing in coastal village located near prime black brant nesting areas. We further request that the comment period be extended past the August 2nd Deadline. Summer is the peak of the subsistence season, and more time to comment would allow greater input by affected people here in our region. **(Comment No. 197982-002)**

Response To: Comment 197982-002

There were two public subsistence-related hearings in Bethel per the request the BLM received from Mr. Naneng. The comment period on the DEIS was extended beyond August 2, concluding on August 23. We have taken the comments from those individuals that attended those public hearings into consideration while developing the Final Preferred Alternative D. Please see specifically lease stipulation K-4 - Goose Molting Area and K-11 - A through G Lease Tracts for a complete description of the protective measures developed to protect molting geese as well other wildlife and subsistence resources from potential adverse impacts from oil and gas activities in the planning area.

TOPIC: OIL FIELD DEVELOPMENT

Comment From: Environmental Coalition (Comment Letter No. 197617)

Assumptions regarding oil field development should be realistic, complete and supported by documentation. An impact analysis should include but not be limited to the following:

• An objective impact assessment criteria adequately defining the extent, intensity, and duration of effects on vegetation, fish and wildlife habitats and populations, subsistence and other resources. Scientific justification for the criteria, as well as citations for impact levels, needs to be provided. **(Comment No. 197617-051)**

Response To: Comment 197617-051

The information provided in the FEIS fully complies with NEPA.

TOPIC: OIL RESOURCES

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

In addition to the misleading comparison of oil that is not recoverable under the current management plan, the disparity between the projected recoverable oil under the current management of the NE NPR-A and the projected recovery of oil under Alternatives B and C is completely out of whack. Leasing 52% of the area with a high potential for oil leads to a projected recovery of only 600 million barrels of oil. But when about 30% more of this area is made available for leasing (i.e. 80% of the area of high oil potential) the projected amount of oil that can be recovered

increases 3.4 times. Leasing that last 20% of the area with high oil potential only yields another projected 434 million barrels of oil of additional oil. These widely varying projections need rational explanation. **(Comment No. 197616-038)**

Response To: Comment 197616-038

There are several considerations involved in making these estimates. First, the resource estimates for the NE Plan

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Amended Draft EIS p. 4-37 says that the estimated recovery under alternative B is "considerably more optimistic." Part of this optimism is attributed to the increase in the "total resource endowment in the 2002 assessment." There is no mention of the increased resource endowment being applied to Alternative A and we cannot determine from the Amended Draft EIS whether the Alternative A estimate was appropriately adjusted. There is reason to believe that it has not been adjusted. See 1998 NE NPR-A EIS/IAP p. IV-G-1 (Estimate that 600 million barrels of oil could be recovered under the Preferred Alternative.) If the increased resource endowment was not applied to Alternative A, then the estimate of recoverable oil needs to be prominently corrected. Additional reasons for the estimate of oil recoverable under Alternative B are the opening of new areas for leasing and a change to performance-based stipulations. This does not make sense. As noted in the body of this letter, there is no rational proportionality between the area available for leasing and the estimate of recoverable oil. A change in management style also would not rationally lead to such a significant difference in the proportions of recoverable oil under the different alternatives since the BLM has successfully leased tracts in the NPR-A that are controlled by the stipulations that were developed in the 1998 ROD. In other words, industry has not shied away from leases that are controlled by the current management plan, and so it is not rational to conclude that industry interest would be significantly different in leases with performance-based ROPs and stipulations. **(Comment No. 197616-039)**

Response To: Comment 197616-039

Alternative A was not adjusted according to the 2002 assessment. The assumptions and analysis for Alternative A, as contained in the 1998 FEIS and ROD, represent the current management plan for NE NPRA. Preparation of the revised plan (2004 DEIS) includes both the reassessment of petroleum potential as well as new analysis of impacts related to different levels of activities. Alternative A is fixed by the 1998 ROD, whereas the current set of alternatives for the revised plan is still in a state of flux until the final ROD is approved.

While it is true that BLM has conducted two successful lease sales in the NE Plan area (industry leasing interest was apparently not affected by restrictive stipulations), in the post-lease period numerous applications for exceptions to the stipulations have been received from industry. Approved permit applications have included performance-based mitigations similar to those adopted for the NW Plan area and now proposed for the new NE Plan. For example, a review of the recently published Alpine Satellite Plan FEIS will show that the setback distances in the Fish Creek NSO area have been modified to allow cost-effective development of the Lookout pool. We believe that the future leasing program in NPRA is better served by realistic regulations that protect biological and cultural resources while allowing cost-effective petroleum operations. Imposing restrictive stipulations that preclude operations does not balance these objectives.

TOPIC: OIL SPILL RESPONSE

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM continues to avoid adequate consideration of the effects of a large oil spill on the coast and the inability to clean up such a spill, especially in broken ice. BLM relies on little analysis in its assertion that oil spill clean up capabilities are sufficient yet this assertion is unsubstantiated by any evidence of effective clean up during those tests. Indeed, other Federal agencies have noted the severe oil spill response limitations in the offshore Arctic environment, including high winds, low temperatures and visibility, high rainfall or snowfall, and the presence of pack ice. See US Army Corp of Engineers FEIS for the Northstar Project at 8-51 (Corps observed that "[g]iven present oil spill response technology, broken ice, unstable ice, rough seas or high wind conditions could hamper the ability or prevent

any cleanup response for over 50% of the year."). (Comment No. 197617-108)

Response To: Comment 197617-108

The amendment is not considering any offshore leasing.

TOPIC: OIL SPILL SCENARIOS

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 4-69, Chapter 4 Environmental Consequences, Section 4.3, Alternative A (No Action Alternative), Section 4.3.4 Water Resources, Section 4.3.4.2 Surface Water and Groundwater Quality, Effects of Spills, fourth paragraph: The third sentence, "The spreading of the spill over about 60 acres . . . could be considered an effect on water quality." An explanation should be provided as to how the 60-acre spread area in Teshekpuk Lake for this 325-bbl spill was calculated, as this affected area differs substantially from the modeling results provided in Appendix K. Table K-6 (page K-13), Fate and Behavior of a Hypothetical 500 bbl Oil Spill from Lagoon Pipelines, indicates that this spill could cover almost 64 square miles after 30 days. (Comment No. 196952-013)

Response To: Comment 196952-013

The spread of the spill could be as small as 60 acres as referenced from the 1998 plan or as large as 64 square miles based on the modeling referenced in Appendix K. The information in Table K-6 was calculated with the SINTEF Oil Weathering Model, Version 2.0 assuming an Alpine crude oil. Data about various types of crude (e.g., Alpine crude) is gathered through small scale and meso-scale laboratory tests. This data is used as input to the oil weathering model, a numerical model. Other inputs to the model include selected sea temperatures, wind speeds, and wave heights. The model is used to predict the oil's properties versus time given the chosen environmental conditions. Differences are likely attributable to the climatic data input.

TOPIC: OUTSIDE SCOPE OF IAP/EIS

Comment From: Kate Stephenson (Comment Letter No. 057320)

It confuses me that this is still an ongoing issue concerning possible oil drilling in the Arctic Refuge. I am a college student at the University of Wisconsin, Madison and recently completed a research project on the effect and distribution of oil drilling in the United States. I find it hard to believe that the Refuge is the last and/or best source for oil drilling. I would like to prove my point from a paragraph taken from my research paper: "An estimated 16 billion barrels of oil has been claimed to be under the Arctic Refuge's coastal plain. However, the U.S. Geological Survey, after 12 years of studying the refuge, estimates there is only 3.2 billion barrels in the coastal plain. (Comment No. 057320-001)

Response To: Comment 057320-001

It is unclear what area the commenter is referring to as the "Arctic Refuge." The commenter is possibly confusing the Arctic National Wildlife Refuge (ANWR) and the National Petroleum Reserve-Alaska (Petroleum Reserve). Although both the Petroleum Reserve and ANWR are located on the North Slope of Alaska, they are different - and not adjacent - areas. The area designated as a National Petroleum Reserve is in the western part of the Arctic Coastal Plain and Arctic Coastal Hills Provinces. The ANWR is 100 miles to the east, adjacent to Canada. This IAP/EIS is for the Northeast Planning Area of the National Petroleum Reserve-Alaska. The commenter is "comparing apples and oranges." The 16 billion barrels (Bbbl) of oil corresponds to the technically recoverable resource estimate (without regard to the economics of finding and production) at a 5 percent probability of occurrence in ANWR. An equivalent estimate by the U.S. Geological Survey (USGS) for the entire National Petroleum Reserve-Alaska is 13.2 Bbbl (technically recoverable at 5% probability). The 3.2 Bbbl number was the mean economically recoverable estimate in

the USGS/BLM 1987 ANWR 1002 area assessment. The current USGS mean estimate is 7.7 Bbbl. The Draft IAP/EIS reports 3.6 Bbbl as the mean economically recoverable estimate at $30/bbl for the Northeast Planning Area only of

Comment From: Kate Stephenson (Comment Letter No. 057320)

If the oil were tapped in ANWR, it would take up to 10 years for the oil to reach the pumps. Moreover, drilling/tapping for oil in ANWR would lead to environmental destruction, exemplified by the Arctic Refuge - Prudhoe Bay site, located some 60 miles west of the refuge in Alaska, which has been a source of crude oil for several years. Much like the refuge, Prudhoe Bay is a tundra that has turned into "1,000 square miles . . . [of] a sprawling industrial zone containing 1,500 miles of roads and pipelines, 1,400 producing wells and three jetports". The oil drilling in Prudhoe Bay has turned the landscape into a landfill of sewage, waste, and old product containers that had been used and discarded." I believe that the drive for money, power, or whatever you would like to call it has blinded American's concerns for the environment and the wildlife that inhabits our nation. **(Comment No. 057320-002)**

Response To: Comment 057320-002

This comment refers to the Arctic National Wildlife Refuge (ANWR), while this Amended IAP/EIS is for the National Petroleum Reserve – Alaska (Planning Area). Although both ANWR and the National Petroleum Reserve – Alaska are located on the North Slope, they are different and located on different portions of the North Slope. The Planning Area is located in the western part of the Arctic Coastal Plain, about 100 miles west of ANWR, which is adjacent to Canada. The National Petroleum Reserve – Alaska is managed by the BLM, while ANWR is managed by the U.S. Fish and Wildlife Service.

TOPIC: PERMITTING AND REQUIRED PERMITS

Comment From: State of Alaska (Comment Letter No. 197620)

Appendix C, Federal, State, and Local Permits and/or Approvals for Oil and Gas Exploration, Development, and Production Activities, Page C-3. Under State, remove the Alaska Department of Fish and Game as issuing Fish Habitat Permits under AS 16.05.840. Replace with: Alaska Department of Natural Resources, Office of Habitat Management and Permitting; issues Fish Habitat Permits under AS 41 .14.84O and AS 41 .14.870. **(Comment No. 197620-101)**

Response To: Comment 197620-101

The text was corrected in Appendix C to note that the Alaska Department of Natural Resources issues Fish Habitat Permits under AS 41.14.840 and AS 41.

TOPIC: PIPELINES AND PIPELINE CONSTRUCTION

Comment From: Michael R. North (Comment Letter No. 196264)

Page 4-28, paragraph 1. The statement that any new pipelines would follow roads (I interpret this to be permanent roads) seems contradictory to the statements on page 4-13 that winter roads are now in vogue over permanent gravel roads, especially in light of the lack of gravel resources in the planning area. Please explain this apparent discrepancy. **(Comment No. 196264-013)**

Response To: Comment 196264-013

The point of this statement is to say that, if possible, new pipelines would follow existing roads and if construction of a new road were necessary than the pipeline/road would be constructed next to each other to minimize impacts. This does not mean that any new pipeline would automatically result in the construction of a new road.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Section 4.2.1.2, Oil and Gas Exploration and Development Activities. Pipeline Construction, Page 4-30. The assumptions listed for pipeline design and construction that would apply to future NPR-A projects include: wide, shallow rivers could be crossed by trenching and burying pipelines, and narrow streams could be crossed by elevated pipelines. This section should be modified to note that fewer impacts would occur to the stream, streambanks, riparian habitat, and aquatic resources if a properly designed elevated pipeline crossing were to be used. Potential problems associated with maintenance, corrosion, and abandonment also would be less with an elevated crossing versus a buried crossing. **(Comment No. 197620-071)**

Response To: Comment 197620-071

Section 4.2.1.2 was modified to note that fewer impacts could occur to stream and riparian habitats if elevated pipeline crossings were used.

Comment From: State of Alaska (Comment Letter No. 197620)

The second paragraph on page 4-85 notes that once installed, suspended and entrenched pipelines would have no effect on stream and water flow characteristics. Experience on the North Slope has shown that effects can occur once buried pipelines are installed. The Badami Pipeline buried crossing of the East Channel of the Sagavanirktok River intersected a narrow, shallow channel draining an abandoned river oxbow. During the spring breakup following installation, water eroded the overburden and pipe backfill at the transition from buried to above ground pipe. As erosion progressed, headwall cutting in the outlet channel of the oxbow threatened to drain the entire oxbow. Several summers of work at this site have been required to stop the headward erosion at this site. Also, heat from the Trans-Alaska Pipeline (TAPS) has altered water temperature and instream plant communities immediately over the pipeline in areas of the Atigun River floodplain. Excavation of instream buried sections of TAPS for corrosion inspection and repair in the 1980s and 1990s produced loss of riparian habitat, increases in sedimentation, and diversion of stream channels. Design techniques for buried pipelines must be scrutinized to avoid such impacts. **(Comment No. 197620-078)**

Response To: Comment 197620-078

As noted in the NRC report on Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope, there are costs and benefits associated with both aboveground and underground pipeline construction over rivers. As noted on page 298 of the report, river breakup and flooding during spring can destroy an aboveground pipeline or erode deeply enough to expose and rupture a line buried in a surface trench, as noted by the commenter. These concerns can be addressed by using horizontal directional drilling to position a pipeline deep beneath the river channel (Lance 2000). Installing a pipeline deep under a river, however, makes detection and cleanup of a spill in the buried segment difficult. The suitability of both aboveground and underground pipelines would be carefully evaluated for each river crossing before construction of pipelines in the Planning Area.

Lance. R. 2000. Industry Overview – "Doing it Right," the Alpine Development on Alaska's North Slope. Presented at Established Oil Technologies and Practices on Alaska's North Slope Workshop, April 2000, Anchorage, Alaska.

Comment From: Rosemary Ahtuangaruak (Comment Letter No. 197990)

And things that will help to reduce these are looking at the pipeline routes, making sure that the pipeline is high enough that the caribou are able to migrate, that we're able to follow the migration and hunt without having to travel to an area that's designed to allow us to hunt through them. The cost of our travels come out of our pockets, it takes away from other things that our families need. And it's really important that the cost of trying to live our lifestyle is not taken from our families. **(Comment No. 197990-081)**

Response To: Comment 197990-081

See response to comment 197990-008 under Caribou - Movements

TOPIC: PLANNING

Comment From: Claudia Greco (Comment Letter No. 169388)

One would assume that the BLM's prime role is to MANAGE the lands under the Bureau's aegis - not to sell them out to special interest groups to profit ONLY those special interest groups. In so doing, the BLM is demonstrating not only a reckless disregard for the ecosystem and its wildlife, but a withering disdain for the people whose survival and culture depend on that ecosystem. BLM's defined role is that of stewardship – not profiteering - and as steward of these federal lands, I don't recall the American taxpaying citizens giving BLM permission to prostitute OUR natural patrimony so its bureaucrats can keep their jobs and their "in" with the Bush administration. Officials - elected or appointed - are transitory; but the effect of such misguided policies are forever. BLM might want to remember that as we approach November. ***(Comment No.* 169388-006)**

Response To: Comment 169388-006

In 1980, Congress authorized "an expeditious program of competitive leasing of oil and gas" in the National Petroleum Reserve-Alaska (P.L. 96-514, Dec. 12, 1980). Section 102 of the Federal Land Policy and Management Act (FLPMA) requires that BLM manage all of its lands from a multiple-use perspective. Oil and gas leasing is a legitimate use of BLM-managed lands and a specific use designated for the National Petroleum Reserve-Alaska since it was established in 1923. The 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS addressed the issues of wilderness, wild and scenic rivers, special areas, visual resource management, and travel management in addition to oil and gas leasing and mitigation measures to protect surface resources. As an agency of the federal government, BLM is responsible for implementing the President's National Energy Policy to President's Energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The mandate further states that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska." In accordance with the President's energy policy, BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing. The BLM has considered your comments in developing the Final Preferred Alternative.

Comment From: Carl Wassilie (Comment Letter No. 179814)

A moritorium on exploration should come into effect immediately in the original 1977 Tekshekpuk Lake Special Area until proper public notice and testimony is heard by US citizens regarding this national treasure and natural historic site. ***(Comment No.* 179814-004)**

Response To: Comment 179814-004

The BLM has provided proper public notification and multiple opportunities for public comments and testimony on potential oil and gas leasing, exploration, and development in the Teshekpuk Lake Special Area. The NEPA process provides specifically for two public input opportunities - scoping and public meetings on the Draft IAP/EIS. As discussed on pages 1-16 and 1-17 of the Draft IAP/EIS, the BLM published a Notice of Intent to Plan and a Call for Nominations and Comments in the Federal Register on June 23, 2003. On September 15, BLM published a Notice of Extension that extended the end of the period for accepting scoping comments from September 30 until October 31. Six public scoping meetings were held throughout Alaska between October 7 and November 13, 2003. Public notices

Comment From: Sharon Wyberg (Comment Letter No. 186677)

We both urge you to instead abandon this sweeping and reckless change and instead select Alternative A, the No

Action Alternative, at this time. It is imperative that fair consideration be given to all uses of these public MULTIPLE USE lands! Our comments are that this plan runs roughshod over any other legitimate use of these lands. **(Comment No. 186677-003)**

Response To: Comment 186677-003

Section 102 of the Federal Land Policy and Management Act (FLPMA) requires that BLM manage all of its lands from a multiple-use perspective. Oil and gas leasing is a legitimate use of BLM-managed lands and a specific use designated for the National Petroleum Reserve-Alaska since it was established in 1923. The 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS addressed the issues of wilderness, wild and scenic rivers, special areas, visual resource management, and travel management in addition to oil and gas leasing and mitigation measures to protect surface resources. Subsequent to establishment of the 1998 Plan, the President's announced the National Energy Policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The mandate further states that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska." In accordance with the President's energy policy, BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing.

Comment From: Jennifer van den Berg (Comment Letter No. 195938)

I also recommend that the Bureau of Land Management defer leasing in the Colville River Special Area, as it did in its Northwest Plan. Planning for the whole Colville should be done for the whole Colville, and not in a piecemeal fashion which fractures what is (like the rest of the Reserve) a whole ecosystem. **(Comment No. 195938-003)**

Response To: Comment 195938-003

At this time BLM (subject to funding) intends to do a separate management plan that will address "day to day" management issues along the Colville River. Allocation decisions (e.g., oil and gas leasing decisions) made in the three National Petroleum Reserve-Alaska IAPs (i.e., the Northeast, Northwest and South) that cover the Colville River will not be addressed in the River Management Plan.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Any revision of the Northeast IAP must fully consider and implement the recommendations of the March 2003 National Research Council (NRC) Report on the "Cumulative Effects of Oil and Gas Activities on Alaska's North Slope." A primary conclusion of the report is that there has not been adequate communication and coordination among federal, state, and municipal permitting agencies, or adequate comprehensive planning to "identify the scope, intensity, direction, or consequences of industrial activities that are judged appropriate and desirable." We believe that multi-agency North Slope-wide comprehensive planning is long overdue. It cannot be delayed any longer, as the potential exists with this proposed IAP amendment to allow the expansion of industrial operations into areas utilized so intensively by wildlife and subsistence users. Additional recommendations of the reporting NRC Committee address the need for ecosystem-level research, documentation of human health effects, expanded socio-cultural research efforts, and investigation of the consequences of water withdrawals, impacts to zones of influence beyond industrial footprints, and air contamination. All of these issues and the others identified in the report must be addressed in this EIS. **(Comment No. 196407-045)**

Response To: Comment 196407-045

The information and conclusions of the NRC (2003) report were considered in the cumulative analysis. As discussed on pages 1-13 through 1-16 of the Draft IAP/EIS, BLM does coordinate with federal, state, and local agencies, and conservation and environmental groups with an interest in resource management, as well as with members of the public. Several federal agencies administer laws that govern activities on public lands, and BLM regularly coordinates with these agencies on resource management efforts. Under several acts, BLM is required to coordinate with state and

local agencies. The BLM coordinates closely with state resource management agencies on issues involving the management of public lands and the protection of fish and wildlife populations. The BLM coordinates at both the national and local levels with several resource advisory groups, including the BLM Resource Advisory Council. To ensure local participation in the decision-making process as it relates to subsistence in the National Petroleum

Comment From: Polly Dyer (Comment Letter No. 196714)

INDIGENOUS WILDLIFE AND PLANT HABITATS: The Bureau of Land Management should give first priority to assuring the continuation of all native wildlife and plants in Alaska's Northwest Arctic areas. Once oil exploration and subsequent development takes place, thesis as now prepared, DOES NOT RECOGNIZE the long range perpetuation of indigenous species. Protecting the wildlife and vegetative life is not only essential for subsistence of Alaska's natives, the original human inhabitants, it is mandatory to assure the ecological integrity of the habitats depended upon by wildlife and that the habitats of vegetation of plants, of tundra, of rivers, of lakes, etc. remain unimpaired. ***(Comment No.* 196714-002)**

Response To: Comment 196714-002

Section 102 of the Federal Land Policy and Management Act (FLPMA) requires that BLM manage all of its lands from a multiple-use perspective. Oil and gas leasing is a legitimate use of BLM-managed lands and a specific use designated for the National Petroleum Reserve-Alaska since it was established in 1923. As required under FLPMA, the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS addressed the issues of wilderness, wild and scenic rivers, special areas, visual resource management, and travel management in addition to oil and gas leasing and mitigation measures to protect surface resources. Subsequent to establishment of the 1998 Plan, the President's announced the National Energy Policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The mandate further states that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska." In accordance with the President's energy policy, BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing. The BLM has considered your comments in developing the Final Preferred Alternative.

Comment From: Michael Graesser (Comment Letter No. 196946)

In addition to the obvious scientific and associated economic merits of protecting the TLSA, there is an important cultural reason for protecting this area: that locations where the wild things are still exist. ***(Comment No.* 196946-009)**

Response To: Comment 196946-009

Designation of an area as a Special Area recognizes that significant surface resources are present and that during oil and gas exploration, the area should be managed to assure maximum protection of identified surface values to the

Comment From: Mark Udall, Congress of the United States (Comment Letter No. 197613)

Eighty-seven percent of the northeastern Reserve is already open to oil and gas companies for leasing. There is no science indicating that the sensitive areas now closed to leasing can be opened without impacting wildlife. In fact, in the five years since the 1998 northeast plan, additional information and analyses point toward significant impacts on fish and wildlife if more of this sensitive area is opened. It would be a mistake to risk the internationally significant ecological resources of Teshekpuk Lake for short-term supply of energy, especially when we know that the United States cannot drill its way to energy independence. ***(Comment No.* 197613-010)**

Response To: Comment 197613-010

Subsequent to the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the analyses in the 2003 Northwest National Petroleum Reserve IAP/EIS and the 2004 EIS on the Alpine Satellite Development Plan indicate that oil and

gas leasing, exploration, development, and production activities with appropriate mitigation measures can occur in the National Petroleum Reserve-Alaska without significant impacts to wildlife. Operational experience with exploration in the National Petroleum Reserve-Alaska supports that conclusion. If you can provide us with the referenced information and analyses that point toward significant impacts on fish and wildlife if more of the Northeast National Petroleum Reserve-Alaska is opened, we will consider it in making decisions at the end of this NEPA process. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National Petroleum Reserve-Alaska. As discussed on page 4-13 of the Draft IAP/EIS, the process of leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale and the start-up of production from any discovered oil fields in the National Petroleum Reserve-Alaska.

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

BLM continues to treat the planning of the Colville River Special Area in incremental steps, despite a unanimous recommendation from the Alaska Resource Advisory Council (RAC) to the Secretary of the Interior in 1998 to complete a watershed plan for the entire Colville watershed. This piecemeal planning approach will lead to unacceptable adverse impacts on the unique values of the area. BLM must address these inadequacies in the SEIS. ***(Comment No.* 197614-022)**

Response To: Comment 197614-022

See response to comment 195938-003 under topic Planning.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Federal Land Management Policy Act (FLPMA) Further, BLM is obligated to manage the public lands consistent with the concept of multiple use. The definition of multiple use (43 U.S.C. § 1702(c)) obligates BLM to prioritize the national public interest in our public lands in terms of both current and long-term needs. These needs (and uses) are both market and non-market based. BLM must consider the "relative" value of resources and cannot authorize a particular use based purely on the contribution of that use to the economy. All management is bounded by the mandate to prevent "permanent impairment of the productivity of the land and the quality of the environment." Under this provision, once a use runs its course, the land must be reclaimed to its original baseline health and integrity. ***(Comment No.* 197617-016)**

Response To: Comment 197617-016

Section 102 of the Federal Land Policy and Management Act (FLPMA) requires that BLM manage all of its lands from a multiple-use perspective. Oil and gas leasing is a legitimate use of BLM-managed lands and a specific use designated for the National Petroleum Reserve-Alaska since it was established in 1923. The 1998 Northeast National

Comment From: Environmental Coalition (Comment Letter No. 197617)

Despite acknowledging this legislative direction and authority in FLPMA (draft IAP/EIS at 1-6) BLM fails to balance short and long-term costs and benefits. The draft IAP/EIS fails to adequately disclose the extent to which resource uses result in significant losses of lands for wildlife habitat, subsistence, watershed protection and wilderness. The Preferred Alternative in draft IAP/EIS does not satisfy the unnecessary and undue degradation provision. ***(Comment No.* 197617-019)**

Response To: Comment 197617-019

The alternatives and accompanying protective measures identified in the Draft Amended IAP/EIS and for the Preferred Alternative herein do meet the standards of FLPMA and do consist of appropriate actions to prevent unnecessary or undue degradation of public lands. The BLM has taken its responsibility for long-term management and the principles of multiple-use and sustained yield seriously. Section 4.8 of the Draft Amended IAP/EIS focused on

short- and long-term effects to resources, but provided limited information on activities to enhance long-term productivity of resources in the Planning Area. Section 4.8 has been revised in the Final Amended IAP/EIS to include more discussion of enhancement activities. Criteria used to determine the magnitude of impacts have been added for each resource discussed in Chapter 4 to help the reader better determine where oil activities could result in significant impacts.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The Reserve has long been recognized as containing major areas important to wildlife. In sharp contrast to the treatment given Reserve Nos. 1, 2, and 3, the NPRPA transferred jurisdiction over Reserve No. 4 to the Secretary of the Interior and renamed it the National Petroleum Reserve in Alaska. In so doing, Congress expressly recognized that protection of the unique natural, fish and wildlife, scenic and historical values of the Reserve would better be evaluated and managed under the authority of the Secretary of the Interior. Congress directed the Interior Secretary to "assure maximum protection" for the subsistence, recreational, fish, wildlife, historical, and scenic values of the Special Areas (42 U.S.C. §§ 6502-03). ***(Comment No.* 197617-069)**

Response To: Comment 197617-069

In 1980, Congress authorized "an expeditious program of competitive leasing of oil and gas" in the National Petroleum Reserve-Alaska (P.L. 96-514, Dec. 12, 1980). In amending the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the BLM is fulfilling a mandate of the President's Energy Policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The mandate further states that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska." The BLM will provide maximum protection for surface resources through mitigation measures developed through this NEPA process, continued consultation and coordination with federal and state resource agencies, and further environmental evaluation of proposed oil and gas activities.

Comment From: Robert Markeloff (Comment Letter No. 197622)

This is the "No Action" alternative which retains current protection levels for critical habitats. Actually since the 1998 plan was issued, additional information and analysis show that the BLM should be more restrictive in this new plan, not less. For example, the National Academy of Sciences March 2002 Report documents significant adverse environmental and cultural effects from 30 years of oil development. ***(Comment No.* 197622-001)**

Response To: Comment 197622-001

Subsequent to the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the analyses in the 2003 Northwest National Petroleum Reserve IAP/EIS and the 2004 EIS on the Alpine Satellite Development Plan indicate that oil and gas leasing, exploration, development, and production activities with appropriate mitigation measures can occur in the National Petroleum Reserve-Alaska without significant impacts to wildlife. Operational experience with exploration in the National Petroleum Reserve-Alaska supports that conclusion. If you can provide us with the referenced information and analyses show that BLM should be more restrictive, we will consider it in making decisions at the end of this NEPA process. The information and conclusions of the NRC March 2003 report are considered in the cumulative analysis in the IAP/EIS.

Comment From: Christine Kulis (Comment Letter No. 197624)

According to the National Research Council's 2003 report on the "Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope", if development moves into the Teshekpuk Lake area of the National Petroleum Reserve-Alaska, Molting waterfowl could be adversely affected (p.123). As a member of Audubon, I believe the Bureau of Land Management should be protecting the wildlife habitat on the Arctic Coastal Plain and not selling out to the oil companies. Politics should not determine your policy. ***(Comment No.* 197624-002)**

Response To: Comment 197624-002

The Draft IAP/EIS analysis also found that development activities in the Teshekpuk Lake area of the National Petroleum Reserve-Alaska could adversely affect molting waterfowl. Several of the stipulations and required operating procedures are designed to mitigate these potential adverse effects. As required under Section 7 of the Endangered Species Act, BLM is consulting with the U.S. Fish and Wildlife Service to assure protection of listed species and their critical habitats. The Teshekpuk Lake area has been designated as a Special Area in recognition that significant surface resources are present and that during oil and gas exploration, the area should be managed to assure maximum protection of identified surface values to the extent consistent with the requirements of the Naval Petroleum Reserve Production Act (NPRPA). The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted. The BLM has considered your comments in developing the Final Preferred Alternative.

Comment From: Jean and Harold Kolb (Comment Letter No. 197627)

Congress in 1976 mandated "maximum protection" for "fish and wildlife and other surface values" during petroleum exploration of the Reserve. ***(Comment No. 197627-003)***

Response To: Comment 197627-003

In 1980, Congress authorized "an expeditious program of competitive leasing of oil and gas" in the National Petroleum Reserve-Alaska (P.L. 96-514, Dec. 12, 1980). In amending the 1998 Northeast National Petroleum Reserve IAP/EIS, the BLM is fulfilling a mandate of the President's Energy Policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The mandate further states that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska." The BLM will provide maximum protection for surface resources through mitigation measures developed through this NEPA process, continued consultation and coordination with federal and state resource agencies, and further environmental evaluation of proposed oil and gas activities.

Comment From: Tom and Sally Overholt (Comment Letter No. 197629)

The BLM proposal does not appear to be based on any credible scientific evidence that reduction in size, increased human contact, and industrial development will not harm wildlife. This is the conclusion of the National Research Council and the Alaska Chapter of the Wildlife Society. ***(Comment No. 197629-002)***

Response To: Comment 197629-002

The BLM does not contend that there will be no impacts to wildlife from increased development and human activity.

Comment From: Christiane Raymond (Comment Letter No. 197631)

After looking over the BLM draft plan it would appear that the present management team has become the lap dogs of the Bush Administration. It is no secret that the President and his cabinet only care about satisfying the special interests of corporate energy barons. The BLM is supposed to manage public land for multiple use, but instead has been instructed to make gas and oil production its number one priority and Interior Secretary Gale Norton has said that the BLM can no longer designate wilderness or study areas in Alaska. I know that the Bush Administration thinks nothing of replacing experts whose findings do not support the President's dismal "energy at any cost" policy. I would not be surprised if officials at the BLM are being coerced into going ahead with expansion of Teshekpuk to satisfy the

powers that be. ***(Comment No. 197631-002)***

Response To: Comment 197631-002

In 1980, Congress authorized "an expeditious program of competitive leasing of oil and gas" in the National Petroleum Reserve-Alaska (P.L. 96-514, Dec. 12, 1980). In amending the 1998 Northeast National Petroleum Reserve IAP/EIS, the BLM is fulfilling a mandate of the President's Energy Policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The BLM will provide maximum protection for surface resources through mitigation measures developed through this NEPA process, continued consultation and coordination with federal and state resource agencies, and further environmental evaluation of proposed oil and gas activities. Although section 603 of the Federal Land Policy and Management Act (FLPMA) directed BLM to inventory all BLM lands for their wilderness values to the extent allowed for in the recommendations for wilderness designation, BLM lands in Alaska were exempted from this mandate. Section 102 of the Federal Land Policy and Management Act (FLPMA) requires that BLM manage all of its lands from a multiple-use perspective. Oil and gas leasing is a legitimate use of BLM-managed lands and a specific use designated for the National Petroleum Reserve-Alaska since it was established in 1923. As required under FLPMA, the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS addressed the issues of wilderness, wild and scenic rivers, special areas, visual resource management, and travel management in addition to oil and gas leasing and mitigation measures to protect surface resources. The Alaska National Interest Lands Conservation Act (ANILCA) directed the Secretary of the Interior to review BLM lands in Alaska "other than lands included in the National Petroleum Reserve-Alaska" for their suitability or non-suitability for preservation as wilderness. Section 1320 of ANILCA makes wilderness reviews discretionary on BLM-managed lands in Alaska. The BLM has exercised this discretion in striving to balance the requirement to implement the President's National Energy Policy to expedite oil and gas leasing and development with the need to protect resources. The BLM has decided not to recommend large portions of the National Petroleum Reserve-Alaska for addition to the wilderness system because such action would fail to meet the management purposes and objectives of this planning effort for the Northeast National Petroleum Reserve-Alaska. The BLM has decided to specifically not consider wilderness recommendation for lands in the Petroleum Reserve deemed to have high oil and gas potential.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Selection of a Preferred Alternative for Final EIS. The U.S Environmental Protection Agency (EPA) has concluded that the Preferred Alternative would likely result in significant adverse environmental impacts to important fish and wildlife resources and in particular to critical waterfowl habitat, caribou calving and insect-relief areas, and caribou migration corridors in the Teshekpuk Lake Special Area. On the basis of information presented in the Draft Amended Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) (Draft EIS), we have determined that the valuable biological, cultural subsistence resources (surface resources) in the Teshekpuk Lake Special Area, the Colville River Special Area, and the other specific areas listed in the 1998 Record of Decision (ROD) continue to merit the protections assured in that decision. The 1998 IAP/EIS and ROD were the results of a substantial and collaborative effort by the BLM; federal, state, and local resource and regulatory agencies; federally recognized Tribes; and residents of affected Environmental Justice communities. The Bureau of Land Management (BLM) determined at that time that significant surface resources in the Planning Area, located primarily in the Teshekpuk Lake Special Area and the Colville River Special Area, deserved special protections. ***(Comment No. 197632-001)***

Response To: Comment 197632-001

The Northeast National Petroleum Reserve-Alaska Draft Amended IAP/EIS found that activities under the Preferred Alternative could pose potentially significant adverse impacts to resources in the Teshekpuk Lake Special Area. The Teshekpuk Lake area has been designated as a Special Area in recognition that significant surface resources are present and that during oil and gas exploration, the area should be managed to assure maximum protection of identified surface values to the extent consistent with the requirements of the Naval Petroleum Reserve Production Act (NPRPA). The BLM will provide maximum protection for surface resources through mitigation measures developed through this NEPA process, continued consultation and coordination with federal and state resource agencies, and further environmental evaluation of proposed oil and gas activities. The stipulations and required operating procedures

in the Draft IAP/EIS have been designed to minimize these adverse impacts. As required under Section 7 of the Endangered Species Act, BLM is consulting with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to assure protection of listed species and their critical habitats. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted. The BLM has considered your comments in developing the Final Preferred Alternative.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

The Draft EIS lacks new or updated biological, subsistence or technological information to support any decrease in protection for those areas. In addition, the Drat EIS does not contain information to support the urgency to open up additional lands within the Planning Area to oil and gas activities. We recommend that the BLM maintain the current level of leasing within the Northeast Planning Area, as described in Alternative A in the Draft EIS, and not open the lands currently closed or under No Surface Activity restrictions. ***(Comment No. 197632-002)***

Response To: Comment 197632-002

Subsequent to the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the analyses in the 2003 Northwest National Petroleum Reserve IAP/EIS and the 2004 EIS on the Alpine Satellite Development Plan indicate that oil and gas leasing, exploration, development, and production activities with appropriate mitigation measures can occur in the National Petroleum Reserve-Alaska without significant impacts to wildlife. Operational experience with exploration in the National Petroleum Reserve-Alaska supports that conclusion. In 1980, Congress authorized "an expeditious program of competitive leasing of oil and gas" in the National Petroleum Reserve-Alaska (P.L. 96-514, Dec. 12, 1980). In amending the 1998 Northeast National Petroleum Reserve IAP/EIS, the BLM is fulfilling a mandate of the President's Energy Policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The mandate further states that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska."

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

EPA acknowledges the Congressional and Presidential directives placed upon the BLM to advance the development of energy resources through further lese sales in the Northeast Planning Area. The 1998 ROD made approximately 4 million acres of land within the Northeast Planning Area available for oil and gas leasing. Approximately 1.3 million acres have been leased to date; therefore, additional lands are currently available for leasing within the Planning Area. In addition, BLM recently made over 8 million acres within the Northwest Planning Area of the NPR-A available for oil and gas leasing. The BLM is also planning for lands that will be available for oil and gas leasing within the oil and gas leasing within the entire NPR-A to demonstrate compliance with Presidential and Congressional directives and meet the Draft EIS Purpose and Need. ***(Comment No. 197632-005)***

Response To: Comment 197632-005

Executive Order 13212 states, in part, that all federal agencies "...take appropriate action, to the extent consistent with applicable law, to expedite projects that will increase the production, transportation or conservation of energy." As a result of the 1998 ROD, 4 million acres of land were made available for leasing. However, a closer inspection of the analysis for the 1998 shows that only 27% of the full economic potential was made available under the Preferred Alternative. The majority of the potential for commercial discovery and development (73%) was restricted by areas closed to leasing or prohibitive lease stipulations. For the present Plan in NE NPRA, the Preferred Alternative expands the areas offered, particularly in the portions of the Plan area most attractive to industry, and has replaced rigid prescriptive lease stipulations with more efficient performance-based regulations. As a result, the current Plan estimates that 54% of the full undiscovered economic potential could be discovered and developed by industry.

Clearly, our current Plan better satisfies the intent of the Executive Order by increasing opportunities for the petroleum industry to conduct successful exploration and development operations in NPRA. Opening vast areas with low petroleum potential, or leasing tracts with prohibitive stipulations, will neither attract industry to explore this high-cost area or expedite future energy projects that are vital to national interests.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

EPA is very concerned that a similar effort, directed toward alternatives to meet the Draft EIS Purpose and Need, was not completed during the preparation of the Draft EIS. The proposed changes to land use management of the Northeast Planning Area would impact ecologically unique waterfowl molting and nesting habitat that significant portions of global populations of geese depends upon. A decrease in the Teshekpuk Lake Caribou herd's health and productivity or alterations in their range would impact subsistence users in North Slope villages, and could cause adverse impacts to threatened species, including the bowhead whale. ***(Comment No. 197632-040)***

Response To: Comment 197632-040

As stated in Chapter One - Section 1.3.1, Purpose and Need, the BLM is responding to the recommendation by the President's National Energy Policy Development Group that the President direct the Secretary of the Interior to consider further lease sales in the National Petroleum Reserve and that such consideration should include areas not currently leased within the northeast corner of the Petroleum Reserve. To that end this agency has carried out the appropriate public process required by the National Environmental Policy Act (NEPA) and has also conducted numerous public meetings outside the scope of regulatory NEPA mandates. The analysis provided in the Draft IAP/EIS offered a range of alternatives and adequately considers the environmental effects of industrial and other land-use activities for each of those alternatives in the Northeast Planning Area. The Final IAP/EIS analyzes an additional alternative which is provided in the final IAP/EIS which takes into consideration the analysis provided in the DEIS, many of the public comments, and related information gathering exercises which will provide the decision maker with the appropriate information to support a Record of Decision. As far as mitigating the associated impacts of oil and gas related activities, we stand behind our belief that performance based stipulations and Required Operating Procedures and the greater flexibility they offer to adapt requirements/standards to specific situations and to modify the requirements/standards if they prove ineffective, not only are adequate but will increase, not decrease, our ability to protect surface resources and subsistence use. The stipulations and Required Operating Procedures that have been developed for the Action alternatives are intended to allow BLM through its permitting and authorization process (see Chapter 2) to use project-specific information (that does not now exist) to refine the requirements and define in the context of the project what such standards as "minimize" or "nonessential" will mean. We believe this is a far more effective approach than to try to define these standards using the "one size fits all" approach based on hypothetical situations. Conditions imposed on project specific authorizations are every bit as enforceable as lease stipulations.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

EPA recommends the BLM provide an opportunity for scientists from government agencies, academia, industry, Tribes, and Knowledge, on resources and their uses within the Planning Area, discuss potential impacts from various land use activities, and reach consensus on a revised management plan for the Planning Area. ***(Comment No. 197632-041)***

Response To: Comment 197632-041

BLM has consulted with several governmental agencies, industries, and North Slope entities in developing the Final Proposed Action. See Chapter 5.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

At a minimum, EPA believes it is essential that proposed changes to the management of lands within the Teshekpuk Lake Special Area or the Colville River Special Area that are considered during the preparation of the Final EIS and ROD be distributed for comment, discussion and consensus among federal, state, and North Slope Borough agency personnel with management responsibilities ad expertise in the surface resources, and their uses, in those areas. The

Final EIS and ROD should document these efforts and the outcomes. **(Comment No. 197632-042)**

Response To: Comment 197632-042

BLM has consulted with several governmental agencies, industries, and North Slope entities in developing the Final Proposed Action. See Chapter 5.

Comment From: Frederick Tukle (Comment Letter No. 197990)

When I think about this, these numerous oil activities happening in the Teshekpuk area, one of the first things that come to my mind is I would recommend to you guys here that you guys go find some of the people in Barrow that has first-hand knowledge of this area. There's some very knowledgeable elders over there that watch this area. Basically, they have like 100 years of history. And when I keep watching these meetings being conducted in Barrow, I've noticed that a lot of these people that has first-hand experience are not present. And then I would recommend real highly that you guys go find these people. And I think these are the ones that are our -- the best people that could help you guys and us with regards to minimizing the impacts, with regards to these animals. **(Comment No. 197990-110)**

Response To: Comment 197990-110

The BLM has undertaken a significant scoping effort to obtain information and concerns from the public including subsistence users. ROP H-1 requires consultation with local, knowledgeable subsistence users in the form of the Subsistence Advisory Panel prior to project development.

TOPIC: PREFERENCE AND OPINION

Comment From: Virgina Alden (Comment Letter No. 196938)

My request: Will you close this area to further exploitation that we persons who have the will to define ourselves as Native and Citizen Americans may exist more fittingly in peaceful purpose?. **(Comment No. 196938-006)**

Response To: Comment 196938-006

It is not within BLM's purview to close the National Petroleum Reserve-Alaska to oil and gas activities. Section 102 of the Federal Land Policy and Management Act (FLPMA) requires that BLM manage all of its lands from a multiple-use perspective. Oil and gas leasing is a legitimate use of BLM-managed lands and a specific use designated for the National Petroleum Reserve-Alaska since it was established in 1923. As an agency of the federal government, BLM is responsible for implementing the President's National Energy Policy to President's Energy policy to "consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve-Alaska." The mandate further states that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve-Alaska." In accordance with the President's energy policy, BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing. The BLM is mandated to manage activities in the Petroleum Reserve to assure maximum protection of the unique cultural, natural, fish and wildlife, and scenic and historical values of this area to the extent consistent with the requirements of the Naval Petroleum Reserve Production Act. The BLM has considered your comments in developing the Final

Comment From: Ron Kim (Comment Letter No. 197611)

Please accept these comments on the proposed amendment to the oil and gas leasing plan for the Northeast National Petroleum Reserve Environmental Impact Statement. I am especially concerned about the impact the Bureau of Land Management's proposal would have on the area around Teshekpuk Lake, one of the most unique and important wetlands in the entire Arctic. **(Comment No. 197611-001)**

Response To: Comment 197611-001

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Susanne C. Moser (Comment Letter No. 197621)

Please accept my comments regarding your Environmental Impact Statement for the Reserve. I am especially concerned about the Impact the Bureau of Land Management's proposal would have on the area around Teshekpuk Lake, one of the most unique and important wetlands in the entire Arctic. ***(Comment No. 197621-004)***

Response To: Comment 197621-004

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Susanne C. Moser (Comment Letter No. 197621)

I urge you to adopt Alternative A, the "No Action" alternative, because it would maintain protection for the entire Teshekpuk Lake Surface Protection Area. This extraordinary ecosystem provides critical habitat for molting geese and nesting habitat for Steller's eiders, northern pintails, yellow-billed loons and other species. It also supports a vitally important caribou herd that Alaska natives depend on for their subsistence. ***(Comment No. 197621-005)***

Response To: Comment 197621-005

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Susanne C. Moser (Comment Letter No. 197621)

Eighty-seven percent of the northeastern reserve is already open to oil and gas companies for leasing. In the five years since the original 1998 northeast plan, additional information and analyses have been accumulated that point toward significant impacts on fish and wildlife if more of this sensitive area is opened. And as mentioned above, all these impacts simply add to the growing impact of climate change on these species and ecosystems, undermining their ability to adapt to rapid change. ***(Comment No. 197621-006)***

Response To: Comment 197621-006

Subsequent to the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the analyses in the 2003 Northwest National Petroleum Reserve IAP/EIS and the 2004 EIS on the Alpine Satellite Development Plan indicate that oil and gas leasing, exploration, development, and production activities with appropriate mitigation measures can occur in the National Petroleum Reserve-Alaska without significant impacts to wildlife. Operational experience with exploration in the National Petroleum Reserve-Alaska supports that conclusion. If you can provide us with the referenced information and analyses that point toward significant impacts on fish and wildlife if more of the Northeast National Petroleum Reserve-Alaska is opened, we will consider it in making decisions at the end of this NEPA process. One way to continue to meet the country's energy needs while investigating and transitioning to alternative energy sources is through oil and gas production in the National Petroleum Reserve-Alaska. As discussed on page 4-13 of the Draft IAP/EIS, the process of leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale and the

TOPIC: PRODUCTION PADS

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-21: ROP E-5. CPAI commends BLM for acknowledging that "Where aircraft traffic is a concern,

consideration shall be given to balancing gravel pad size and available supply storage capacity with potential reductions in the use of aircraft to support oil and gas operations." This decision can be critical to the acceptance of a project by local communities and to the economics of a project. **(Comment No. 196557-060)**

Response To: Comment 196557-060

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Section 4.2.1.2, Oil and Gas Exploration and Development Activities. Gravel. Page 4-23. The last paragraph on this page discusses the use of rigid foam board insulation in gravel pads. While this technique may reduce, to some extent, the amount of gravel needed, it poses problems during gravel pad reclamation activities. The use of foam within or beneath gravel pads creates problems when the pad is rehabilitated. The foam may break into small pieces that can be carried offsite by wind if the material of the pad is required to be removed because of site contamination remediation or material reuse at site closure. Inclusion of foam in reuse gravel will likely make this material unsuitable for other uses. Use of foam within gravel roads and pads should be managed and designed to accommodate these concerns. **(Comment No. 197620-070)**

Response To: Comment 197620-070

The BLM considered your comments during the development of the Final Proposed Action. The BLM will prepare detailed project-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical, biological, and human environment. Development of these measures will consider factors such as the type of activities (what), the equipment and operational plans (how), the timing and duration (when), the characteristics of the physical location (where), and the specific environmental resources that might be impacted.

TOPIC: PURPOSE AND NEED

Comment From: John Strasenburgh (Comment Letter No. 185987)

Clearly, what BLM has orchestrated here, despite what you profess, is not an analysis based on sound science and meaningful public process. It is a predetermined policy decision driven by industry, through its undue influence on the Energy Task Force, and by the ideology of the Bush/Cheney administration. This administration doesn't believe in sound science and public process; it believes in twisting science and ignoring the public in order to meet its own policy objectives. The track record is indisputable, and this amendment process is another egregious example. **(Comment No. 185987-006)**

Response To: Comment 185987-006

The BLM has carried out the appropriate public process required by the National Environmental Policy Act (NEPA) and has also conducted numerous public meetings outside the scope of regulatory NEPA mandates. The analysis provided in the Draft IAP/EIS offers a range of alternatives and adequately considers the environmental effects of industrial and other land-use activities for each of those alternatives in the Northeast Planning Area. The Final IAP/EIS which takes into consideration public comment, will then provide the decision maker with the appropriate information to support a Record of Decision.

Comment From: Robert Davison (Comment Letter No. 194259)

The purposes of the proposed amendment to the 1998 plan are "(1) to evaluate exploration and development opportunities that could provide access to significant new oil discoveries, while remaining sensitive to biological and subsistence values, and (2) to consider changing the current prescriptive stipulations into a mixture of prescriptive

and performance-based stipulations similar to those being developed for the Northwest portion of the National Petroleum Reserve." However, the preferred alternative (Alternative B) resulting from the BLM evaluation and consideration would significantly disrupt the balance between oil and gas development and protection of wildlife and their habitats in the northeast portion of the NPR-A, to the detriment of the wildlife resources. ***(Comment No.* 194259-004)**

Response To: Comment 194259-004

The BLM is confident that Alternative B is a well balanced alternative that would facilitate the development of the available oil and gas resources, as well as provide protection for the natural wildlife resources found in the Northeast National Petroleum Reserve-Alaska.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

We are not aware of significant new wildlife or subsistence data, or industry technology that has been reported, discussed, and validated since 1998 that would justify opening areas that are now closed to leasing or surface facilities. The BLM's preferred alternative would leave 213,000 of the 600,000 acres now closed off-limits to leasing for the protection of habitat critical to molting waterfowl. We believe that the remaining 387,000 acres are equally as deserving of closure for the protection of caribou, waterfowl, and fish populations, as well as for subsistence harvests. ***(Comment No.* 196407-006)**

Response To: Comment 196407-006

As stated in Chapter One of the FEIS - 1.3.1, Purpose and Need, BLM is responding to the recommendation by the President's National Energy Policy Development Group that the President direct the Secretary of the Interior to consider further lease sales in the National Petroleum Reserve and that such consideration should include areas not currently leased within the northeast corner of the Petroleum Reserve.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

There have been inconsistent explanations of the BLM's goals in undertaking this proposed amendment, and in the finality of certain decisions regarding revision of the existing management structure. With respect to the need to open areas now closed or subject to No Surface Occupancy restrictions, the Draft's Executive Summary states that the "energy resources of the Petroleum Reserve are essential to meeting our nation's energy demands, will enhance domestic energy production, and decrease our nation's dependence on foreign oil sources." It is unclear how something as speculative as the recoverable oil reserves of the NPR-A can be "essential" to meeting an ever-rising national demand for energy. ***(Comment No.* 196407-019)**

Response To: Comment 196407-019

As stated in Chapter One - Section 1.3.1, Purpose and Need, the BLM is responding to the recommendation by the

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Likewise, there was much talk during the scoping phase of this effort about "new information" that justified a review of the existing management plan. BLM has never adequately responded to the assertions of many scoping commenters strongly questioning whether there was any technical, biological, or subsistence data newly available that would justify a reassessment of the 600,000 acres now closed to leasing or surface facilities. In fact, significant arguments were offered that the balance of new information should favor maintaining or enhancing existing protections. These also have never been sufficiently addressed by BLM. ***(Comment No.* 196407-020)**

Response To: Comment 196407-020

See response to comment 196407-019 under Purpose and Need

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

At different times, BLM has stated that it is amending the 1998 NE NPR-A EIS/IAP and ROD because of (1) the Environmental Policy and Conservation Act, (2) a recommendation from the President's National Energy Policy Development Group to consider additional leasing in the Northeast NPR-A, (3) new studies and information, and (4) better technology. The BLM cannot reasonably rely on any of these as a purpose or a need for amending the 1998 NE NPR-A EIS/IAP. As we will see, the Energy Policy and Conservation Act instructs BLM to generate an inventory within two years of restrictions and impediments to the development of resources. It is implicit in Congress asking for an inventory that Congress would then consider passing legislation to remove those restrictions or impediments that Congress determined should be removed. BLM has put the cart before the horse and assumed a role for itself that Congress did not intend. Instead of generating the inventory, as has been done elsewhere in the country, the BLM in Alaska has taken it upon itself to remove what it feels are restrictions and impediments. The recommendation of the President's National Policy Energy Development Group is, well, a recommendation. **(Comment No. 197616-002)**

Response To: Comment 197616-002

The BLM considered your comments during the development of the Final IAP/EIS.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Even if the recommendation could be a reason for the BLM to act (we think it cannot), amending the 1998 NE NPR-A EIS/IAP is unnecessary because that 1998 EIS already had recently considered additional leasing in the Northeast Planning Area and determined that it was not appropriate under the applicable statutory mandates. Also, this "recommendation" by an advisory group cannot legally override the reasoned choices that the BLM made in the 1998 NE NPR-A ROD. **(Comment No. 197616-003)**

Response To: Comment 197616-003

The 1998 Northeast NPR-A IAP/EIS did not conclude that additional leasing in the NPR-A was not appropriate under the applicable statutory mandates. Rather, as set forth in the ROD for the 1998 IAP/EIS, the agency determined that the alternative selected would best satisfy the agency's goals set forth in the purpose and need section of the

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Presidential policy alone is not a legally sustainable or sufficient reason to amend the 1998 NE NPR-A EIS/IAP or the 1998 ROD, particularly in light of Congress's intent to reserve those choices for itself. **(Comment No. 197616-005)**

Response To: Comment 197616-005

It is certainly the case that the activities proposed in the Amended IAP/EIS are consistent with recommendations of the National Energy Policy Development Group made to the President that he direct the Secretary of the Interior to consider additional environmentally responsible oil and gas development through further lease sales in the National Petroleum Reserve-Alaska, including the northeast corner of the reserve. However, we wish to emphasize that there are a number of reasons BLM is undertaking the Amended IAP/EIS. The activities proposed in the amendment are consistent with the objectives and authority of the National Petroleum Reserve Production Act (NPRPA). Due to an interest in increasing the nation's domestic energy production and decreasing dependence on foreign oil, Congress enacted legislation as part of the 1981 Interior Appropriations Act, which authorized competitive oil and gas leasing in the NPR-A. Department of the Interior and Related Agencies Appropriations Act for Fiscal Year 1981, Pub. L. No. 86-514, § 100, 94 Stat. 2964 (1980), states that legislation, which is contained in the NPRPA, directs the Secretary of the Interior to undertake "an expeditious program of competitive leasing of oil and gas" in the NPR-A, 42 U.S.C. § 6508. To ensure that oil and gas activities are conducted in an environmentally responsible manner, the NPRPA also requires that the activities be subject to "conditions, restrictions or prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources

in the NPR-A," and that "maximum protection of surface values", consistent with the requirements of the act, be provided in designated Special Areas, 42 U.S.C. §§ 6504 & 6508. By considering leasing additional lands in the northeast NPR-A, the proposed activities would facilitate meeting the goal of the NPRPA, which would go toward satisfying the nation's energy needs by increasing the domestic energy supply. Moreover, the adoption of various general and specific lease stipulations and required operating procedures, including setbacks, no surface occupancy restrictions, area deferrals, and other protections, in biologically sensitive areas such as the Colville River Special Area and the Teshekpuk Lake Special Area, would serve to mitigate adverse impacts on important surface resources, thereby satisfying the Act's requirement of providing maximum protection in special areas and necessary and appropriate mitigation measures.

Also, the proposed activities in the Amended IAP/EIS would potentially make available for leasing, lands with important oil and gas resources thereby helping to meet the nation's energy needs. The results of exploration conducted in or near the Planning Area suggest that oil and gas reserves in the Planning Area may be greater than originally believed at the time the 1998 IAP/EIS for the Northeast NPR-A was prepared. At that time, little exploration work had been conducted in the Northeast NPR-A. Since then, 17 exploration wells have been drilled on leases acquired through 2000, and additional exploration drilling has been conducted in the Alpine field, portions of which extend into the Northeast NPR-A. While the reserve potential of the Alpine field was estimated to be 365 million barrels (Mmbbl) in 1998, the results of these recent exploration activities indicate a reserve potential of roughly 450 Mmbbl, which would make the Alpine Project field one of the largest fields in Alaska.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The BLM has asserted that this amendment process is necessary; (1) because Congress amended the Energy Policy and Conservation Act in 2000; (2) to implement the recommendations of the President's National Energy Policy Development Group; and (3) because of what the BLM has learned since the 1998 NE NPR-A EIS/IAP was finalized. When the reasons given by the BLM for this amendment process are put to the test, they all prove hollow. So, what is driving the BLM's amendment of the NE NPR-A EIS/IAP and ROD? It all boils down to policy. Policy alone is not a legally sufficient reason to amend the 1998 NE NPR-A EIS/IAP and ROD. ***(Comment No.* 197616-012)**

Response To: Comment 197616-012

The BLM considered your comments during the development of the Final IAP/EIS.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Like EPCA, this is identified in the "Purpose and Needs" section of the Amended Draft EIS.10 Unlike EPCA this was an excuse for the amendment of the NE NPR-A EIS/IAP and ROD that was advanced during scoping. But wait a minute, this is just a recommendation. How does a recommendation from an ad hoc advisory group provide legal authority to amend a recent Record of Decision? It doesn't. Nowhere does the Amended Draft EIS claim that the President has directed the consideration of additional leasing in the Northeast NPR-A. In the same letter that we asked the BLM to explain how EPCA led to its decision to amend the NE NPR-A EIS/IAP and ROD, we asked it to explain how this recommendation to the President amounted to anything. As we have already said, the BLM did not respond. Even if the President had directed that this recommendation be followed, a valid administrative action cannot be changed without "a satisfactory explanation for [the] action including a rational connection between the facts found and the choices made."11 In addition, under federal regulations, "Environmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made." ***(Comment No.* 197616-020)**

Response To: Comment 197616-020

The Northeast amendment and EIS is assessing the impacts of several alternatives not justifying a decision that has already been made. The BLM has made no decisions on this amendment. Also see response to comment 196407-019 under Purpose and Need.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The fact that the 1998 NE NPR-A EIS/IAP and ROD were so recent, only about four years old, at the point in time that this amendment process was announced, makes it that much harder to show that satisfactory explanation and the type of new or additional facts that would justify such changes. The very decision being proposed here, opening up the area around Teshekpuk Lake, was considered only four years before, in the 1998 NE NPR-A EIS/IAP. In that document, Alternative D considered leasing 73% of the area in the Northeast NPR-A with a high potential for oil and gas (as opposed to the total acreage in the Northeast NPR-A).13 This Alternative looks nearly identical to the leasing scenario in Alternative B of the Amended Draft EIS which makes only 7% more of the area with a high potential for oil and gas available for leasing.14 Alterative E in the 1998 NE NPR-A EIS/IAP considered leasing all of the Northeast NPR-A.15 Alternative C in the Amended Draft EIS also considers leasing all of the Northeast NPR-A.16 So, leasing of additional areas in the Northeast NPR-A has already been recently considered in form and substance virtually unchanged from what is now being proposed - and not adopted. **(Comment No. 197616-021)**

Response To: Comment 197616-021

See response to comment 196407-020 under topic Purpose and Need.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Finally, BLM initially claimed (prior to and during scoping) that amendment of the 1998 NE NPR-A EIS/IAP is appropriate because it had "learned a lot during the last four years." We were told during scoping meetings and in press releases that the BLM now had better information from new studies. In our NE NPR-A Scoping Letter we showed that the "studies" that we were told justified the amendment of the 1998 NE NPR-A EIS/IAP were either incomplete or did not support the changes to the management of the Northeast NPR-A that the BLM wanted to consider in this amendment process.19 We were not the only ones who did not find substance in the BLM's claim that what it had learned could justify amending the 1998 NE NPR-A EIS/IAP and ROD. The North Slope Borough said in its scoping letter that it was not aware of significant new data that justified amending the surface resource protections that are already in place. Representatives from other federal agencies had also informally agreed that no new studies changed the basic information that was discussed in the 1998 NE NPR-A EIS/IAP or that led to the management of the Northeast NPR-A as adopted in the 1998 NE NPR-A ROD. Those scoping comments apparently caused the BLM to re-evaluate whether the proffered reasons withstood scrutiny. The BLM apparently concluded that they did not, since the BLM has now dropped those claims. The "Purpose and Need" section in the Amended Draft EIS does not identify new or better information as a justification for this process. We have completely reviewed the Amended Draft EIS and can tell that this is not an accident because, simply put, the BLM has not learned a lot in the years since the 1998 NE NPR-A EIS/IAP became final. The studies that the BLM told us that it was relying on during scoping seem to no longer be driving it to amend the 1998 NE NPR-A EIS/IAP or ROD. **(Comment No. 197616-023)**

Response To: Comment 197616-023

See response to comment 196407-020 under topic Purpose and Need.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

If it was not new studies or understanding about wildlife in the Northeast NPR-A that the BLM had learned from, could have it learned that there is a better way to explore for or to develop oil and gas that has less impact and would therefore perhaps justify opening areas to development that were judged too sensitive for development just four years before this process began? That can't be right because the 1998 NE NPR-A EIS/IAP and the Amended Draft EIS basically use the same roadless development scenario.22 The industry, which in 1998 touted roadless development as the wave of the future, is now abandoning the concept. **(Comment No. 197616-024)**

Response To: Comment 197616-024

The "Roadless" concept as described in Chapter 4, Section 4.2.1.2, has not been abandoned. Also, see response to comment 196407-020 under Purpose and Need.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The BLM has also tried to justify the amendment of the 1998 NE NPR-A EIS/IAP by urging a supposed need for flexibility that it says is not built into the 1998 NE NPR-A ROD.41 This reason for amending the 1998 NE NPR-A EIS/IAP and ROD has always rung hollow because the BLM has only had limited experience implementing the 1998 NE NPR-A ROD. As the Amended Draft EIS acknowledges, "the implementation of the 1998 package of prescriptive stipulations has been underway for a relatively short period of time, limiting an empirical assessment of effectiveness."42 Logically, the same short time period also has limited the BLM's experience from which it can conclude that the 1998 NE NPR-A ROD is too inflexible. The BLM has not cited to any examples of times when the 1998 NE NPR-A ROD was too inflexible. In fact, in the Alpine Satellite planning process the BLM has seemed willing to allow lessees to virtually ignore the stipulations.43 Perhaps what the BLM means to say is that it wants to have different stipulations that will allow lessees to do more. That is not achieved through greater flexibility, but instead is a fundamental change in management which does not provide the same level of protection as the 1998 NE NPR-A ROD.44 ***(Comment No.* 197616-044)**

Response To: Comment 197616-044

See response to comments 196407-020 under topic Purpose and Need and 196407-011 under topic Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

BLM also has suggested that there's some great merit to having consistency between the management standards of the Northeast NPR-A and the Northwest NPR-A that would justify sweeping the entire 1998 process and the consensus that was reached out of the way. Nonsense. The Northeast NPR-A alone contains over 4.6 million acres, an area larger than many entire States. The concept that those areas cannot be readily managed under somewhat different regimes is ludicrous. ***(Comment No.* 197616-049)**

Response To: Comment 197616-049

Both areas are within the National Petroleum Reserve – Alaska and are administered under the same regulations, also, the companies doing business in both areas are generally the same. Accordingly, we believe consistency in operating requirements makes sense.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

What we are seeing here is that the choice to change the stipulations in the 1998 NE NPR-A ROD and to open more of the Northeast NPR-A has already been made. The BLM has been trying, maybe even struggling, to find a legal or factual justification for that choice. But its legal and factual reasons for amending the 1998 NE NPR-A EIS/IAP and ROD have no substance. In effect, the BLM is seeking to replace the rational decisions that it has previously made in response to directives from Congress with the policy choices of the current Presidential administration.61 In the absence of substantial new facts or information, the BLM cannot do this without effecting a change that is arbitrary and capricious. Such an arbitrary and capricious action does not meet the standard required of actions taken by a federal agency. ***(Comment No.* 197616-068)**

Response To: Comment 197616-068

See response to comment 196407-006 under topic Purpose and Need and response to comment 196407-035 under

topic Stipulations and ROPs.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS fails to demonstrate that oil and gas development in the Teshekpuk Lake Surface Protection Area is warranted or permissible. BLM states that it is undertaking this NEPA process to fulfill the mandates of the President's energy policy, to meet its obligations under various federal laws, and to meet the country's energy needs. None of those statutes or proposals demonstrates a need to place the most sensitive biological and cultural resource values in the Northeast Planning Area at risk. Indeed, the proposed action violates BLM's obligations under the statutes governing management of the Reserve to protect the diverse biological and cultural values of the Reserve, including the obligation to provide maximum protection within the Teshekpuk Lake Special Area. **(Comment No. 197617-005)**

Response To: Comment 197617-005

See responses to comments 183937-005 and 196949-011under special Designation Areas.

Comment From: Environmental Coalition (Comment Letter No. 197617)

NO AUTHORITY FOR PROPOSED ACTIONBLM cites the President's energy policy, the Naval Petroleum Reserves Production Act (NPRPA), 42 U.S.C. § 6501, et seq., the Federal Land Policy and Management Act (FLPMA), 43 U.S.C. § 1701, et seq., as the primary sources of authority for leasing in the draft Amended IAP/EIS. None of those statutes or proposals, however, provide authority or adequate justification for the action proposed by BLM in the draft IAP/EIS. **(Comment No. 197617-011)**

Response To: Comment 197617-011

See response to comment 196407-006 under topic Purpose and Need.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The National Petroleum Reserve Production Act does not direct BLM to pursue an aggressive leasing and exploration in the absence of adequate information and analysis. In fact, the 1980 appropriations rider calling for "an expeditious program of competitive leasing of oil and gas," 42 U.S.C. § 6508, does not authorize leasing at this time. Rather, it authorized only the lease sales in the early 1980s, and those leases have expired. As explained in the briefing associated with the plaintiffs' summary judgment on Count I of the First Amended Complaint (incorporated herein by reference) filed in The Wilderness Society v. Norton, No. 98-2395 (RWR) (D.C. D.C.), the Secretary of the Interior lacks authority to lease lands in the Reserve for oil and gas activities. **(Comment No. 197617-012)**

Response To: Comment 197617-012

As to the timing of the leasing program to be conducted in the Petroleum Reserve, 42 U.S.C. § 6508 only says the first lease sale shall be conducted within 20 months of December 12 1980, no ending date for the leasing program is given.

Comment From: Environmental Coalition (Comment Letter No. 197617)

THE PROPOSED ACTION IS UNREASONABLY NARROW IN LIGHT OF THE PURPOSE AND NEED FOR THE ACTION The draft IAP/EIS narrowly defines the proposed action as an amendment to the 1998 IAP/EIS "to consider opening portions" of the Northeast Planning Area "that are currently unavailable for leasing," and "to develop performance based lease stipulations" for the Planning Area (draft IAP/EIS at 1-3). In contrast, the purpose and need for the proposed action is described in much broader terms focusing on the need to "carry out its management responsibilities and respond to Presidential and Congressional directives to the Secretary of the Interior" (draft

IAP/EIS at 1-5). The narrowly framed proposed action in this case is not required by the several statutes setting out the Secretary's management responsibilities for the National Petroleum Reserve-Alaska and it is not required by any Presidential directive either. The proposed action being considered by BLM in this draft IAP/EIS is in fact inconsistent with the statutory mandate to protect the key fish, wildlife, subsistence, wilderness and other non-oil resources of the Reserve. BLM should consider a more reasonable proposed action and, as discussed below, a more reasonable range of alternatives that focus on better protection of the key surface resources of this incredibly important area. ***(Comment No.* 197617-020)**

Response To: Comment 197617-020

We believe the Proposed Action and other alternatives presented in the Draft do comply with our mandate, see responses to comment 196949-011 under Special Designation Areas and comment 196407-035 under Stipulations and ROPS.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Even if the policy could be interpreted to suggest consideration of the option of opening areas now closed to leasing, it does not require that such an option be considered exclusively or that BLM so narrowly define its proposed action (or, as discussed below, the alternatives it considers in the EIS). BLM could, fully consistent with this policy, consider a range of options for the Planning Area. ***(Comment No.* 197617-027)**

Response To: Comment 197617-027

BLM considered a range of options which included leaving the area north of Teshekpuk lake unavailable to oil and gas leasing (i.e., the No Action Alternative) to making the entire area available (Alternative C).

TOPIC: PURPOSE AND NEED

ISSUE: EPCA

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Let's start by looking at the Energy Policy and Conservation Act ("EPCA"). The amendment to EPCA passed by Congress in 2000 calls for inventorying oil and gas assets, not for changing recently and properly adopted surface use restrictions. Our research has not shown any other area of the country where an EPCA process has involved the type of wholesale changes to land use provisions that are proposed here. As we will see, EPCA provides no authority for the proposed changes. ***(Comment No.* 197616-013)**

Response To: Comment 197616-013

See response to comment 196407-020 under topic Purpose and Need.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

In giving this instruction, Congress was asking for information on restrictions and impediments so that it could decide whether to pass legislation in particular instances that would make development easier. "Restriction" and "impediment" are neutral terms. A provision barring oil drilling on the White House lawn is a restriction or an impediment, but that doesn't by itself mean that removing that restriction is the right or appropriate thing to do.4 Instead of giving Congress the information that it requested about restrictions and impediments to development in Alaska, the BLM is proceeding on its own to decide what is and isn't appropriate. The fact that national energy policy legislation is deadlocked in Congress doesn't change the fact that EPCA does not give the BLM any authority to do what it is doing. In fact the BLM hasn't even done what EPCA does require, namely generating that inventory (which has been done elsewhere in the country). ***(Comment No.* 197616-015)**

Response To: Comment 197616-015

See response to comment 196407-020 under topic Purpose and Need.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Identifying the extent and nature of any restrictions on the development of the oil and gas resources beneath the NPR-A can be done by reading the 1998 NE NPR-A ROD,5 then submitting a report to the appropriate Congressional subcommittees. The process here is not consistent with how the BLM is applying EPCA elsewhere in the United States. When the BLM conducted its EPCA review for five oil and gas producing basins in the Rocky Mountains region all it did was identify restrictions in the existing leases. That inventory did not purport to change the management of those basins or amend the existing leases. As discussed in Footnote 49 below, the President's own National Energy Policy Development Group (the very group on whose recommendations the BLM relies to justify this process) has issued a policy recommendation to President Bush that demonstrates that it, too, believes that EPCA authorizes only study of restrictions on development, not executive action. ***(Comment No.* 197616-016)**

Response To: Comment 197616-016

See response to comment 196407-019 under topic Purpose and Need.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Absolutely nothing in EPCA directs the BLM to amend the 1998 NE NPR-A EIS/IAP or ROD. This fact is born out by the BLM's past practice which shows that it has not interpreted EPCA as requiring anything more than a report. We find it interesting then that EPCA was not identified as authority for amending the management of the Northeast NPR-A until after the scoping comment period had ended. If EPCA was truly one of the reasons for the BLM's decision to amend the 1998 NE NPR-A EIS/IAP and ROD, BLM would not have waited until months after the amendment process had started to cite EPCA for the first time as a justification for the process. Our organizations' scoping comments of last October challenged the BLM's authority to amend the 1998 NE NPR-A EIS/IAP and ROD.8 The sudden appearance of EPCA as a justification after the close of scoping sounds a lot like BLM recognized it was on weak ground and was grasping for any support it could find elsewhere. EPCA, however, doesn't provide that support. ***(Comment No.* 197616-017)**

Response To: Comment 197616-017

See response to comment 196407-019 under Purpose and Need

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

After we first heard that the BLM was relying on EPCA as a reason to amend the 1998 NE NPR-A EIS/IAP and ROD, we thought that perhaps the community was missing something in its analysis. So, we asked the BLM in a letter to explain how EPCA could constitute the need or purpose for amending the management of the Northeast NPR-A. (See letter dated January 6, 2004 attached hereto as document No. 1). We never received a response. There is something more going on here, as we will see shortly. ***(Comment No.* 197616-018)**

Response To: Comment 197616-018

See response to comment 196407-019 under Purpose and Need

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

We found Information Memorandum ("IM") 2003-233 on the internet. This is a directive from the Secretary of the Interior to the state heads in the rocky mountain states where the BLM inventoried lease stipulations and impediments

to take steps to reduce or eliminate these. http://www.blm.gov/nhp/news/releases/pages /2003/pr030807_EPCA.htm. This directive applies only to those areas where the EPCA inventory has been completed, and on its face does not appear to apply to Alaska, although it is certainly instructive of the BLM's general attitude towards existing environmental protections. IM 2003-233 references an IM 2003-137 that is also related to the "integration" of the EPCA inventory into land use planning. We could not find this IM, but we think that it is part of, or should be part of the BLM's administrative record for this amendment process. **(Comment No. 197616-059)**

Response To: Comment 197616-059

A copy of IM 2003-137 is included in the Administrative record.

TOPIC: PURPOSE OF NPR-A

Comment From: Doug Canady (Comment Letter No. 149296)

I am commenting on the proposed amendment to the oil and gas leasing plan for the Northeast National Petroleum Reserve Environmental Impact Statement. I am especially worried about the proposal to use the American people's oil "savings account" in the Western Arctic Reserve. I have always been taught that with my finances, in order To Have It When You Need It, Save It When You Have It. The Western Arctic Reserve is the American people's energy savings account to use When We Need It. The oil is in a safe place in the ground and is in storage for America in times of emergency. That time will come, but now is not the time. There is no emergency. Oil is still relatively cheap in America considering the rest of the World's prices. The proposal to drill in this area is for reasons of profit. That is not what the Reserve was wisely set aside for by our predecessors. **(Comment No. 149296-001)**

Response To: Comment 149296-001

The U.S. imports about half of its oil supply, and the U.S. Department of Energy projects that the proportion of oil coming from overseas will near 68 percent by 2025. One way to meet the country's energy needs is through oil and gas production in the National Petroleum Reserve-Alaska. As discussed on page 4-13 of the Draft IAP/EIS, the process of leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale and the start-up of production from any discovered oil fields. "To Have It When You Need It" in relation to providing oil to meet the Nation's needs, BLM needs to begin the planning process 10 to 15 years beforehand.

Comment From: Doug Canady (Comment Letter No. 149296)

Please leave the oil in America's savings account in the Western Arctic Reserve for times of true emergency. Let's be wise and stall any plans for drilling in this area at this time. Thank You Very Much! **(Comment No. 149296-002)**

Response To: Comment 149296-002

As discussed on page 4-13 of the Draft IAP/EIS, the process of leasing, exploration, and development, including the associated environmental reviews, takes many years. It is likely that 10 years or more would pass between a lease sale and the start-up of production from any discovered oil fields in the National Petroleum Reserve-Alaska. To meet demands for oil during a time of true emergency, oil fields would need to be already developed and producing with planned capability to increase production rates.

TOPIC: RESEARCH AND MONITORING TEAM

Comment From: John Strasenburgh (Comment Letter No. 185987)

The provisions and stipulations of the 1998 document are absolutely necessary in order to protect critical wildlife

habitat and subsistence culture. In removing the bulk of these requirements and in eliminating, in particular, the research and monitoring team, you are poised to do serious and permanent damage to a critical area. ***(Comment No. 185987-008)***

Response To: Comment 185987-008

The Research and Monitoring Team (RMT) was re-established and tasked with developing a monitoring plan for Northeast NPR-A. This group is proceeding to develop such a plan.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

It is seen on the North Slope as a troubling lack of agency commitment to the protections promised in 1998 that the RMT's charter was allowed to lapse, and that the group did not meet for more than a year before it was reconstituted. BLM has offered the suggestion that a broader multi-agency science strategy can be developed for the entire North Slope. That is an admirable and ambitious goal, but should not be pursued at the expense of the area-specific work of the RMT when clearly the Northeast NPR-A is currently the primary focus of industry interest on the North Slope. ***(Comment No. 196407-017)***

Response To: Comment 196407-017

The North Slope Science Initiative will not be pursued at the expense of the area-specific work of the Research and Monitoring Team. The RMT was re-established and tasked with developing a monitoring plan for Northeast NPR-A this group is proceeding to develop such a plan.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 1-15, first paragraph after the bullets: It may have been clear from the various activities listed in the bullets and other developments across the North Slope that some new, broader organization and mission beyond that of the RMT was called for in the long run. That was not the conclusion of the National Research Council's cumulative effects report, and it was not at all clear, and certainly not warranted, that such a group "replace the RMT" as is stated. Rather, just when industry interest was expanding dramatically into the NPR-A, it was against all reason and the wishes of the majority of its members, that the BLM allowed the RMT's charter to lapse in March 2003. The group has since been reconstituted, but not before considerably more than a year had passed without a meeting. This was particularly frustrating given that it had taken three years for the RMT to be organized and become fully operational to the extent that money was actually being allocated and spent on much needed research in NPR-A areas already by that time subjected to exploration activity. ***(Comment No. 196407-057)***

Response To: Comment 196407-057

Several comments in this section discuss the role of the RMT. Please read the other comments in this section.

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

The 1998 Record of Decision (ROD) for the Northeast Plan explicitly directed creation of a Research and Monitoring Team (RMT) to advise and coordinate research and monitoring projects related to effectiveness of stipulations and surface resource impacts. The formation of this RMT was put on hold in spring 2003. BLM must justify this decision relative to compliance with commitments made in the ROD. ***(Comment No. 197614-026)***

Response To: Comment 197614-026

The Research and Monitoring Team (RMT) was re-established and tasked with developing a monitoring plan for Northeast NPR-A this group is proceeding to develop such a plan. We also believe these mitigations would provide the flexibility needed to require such alterations in facility design and operations if significant impacts are identified,

utilizing the appropriate environmental reviews, which may not be a major NEPA action.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Along these lines, recall as well that in the 1998 NE NPR-A ROD the BLM committed to setting up and funding the Research Monitoring Team ("RMT") to "coordinate research and monitoring projects related to the effectiveness of stipulations and surface resource impacts."95 Yet, when the RMT's charter ended two years ago in November of 2002, the BLM did not renew it.96 ***(Comment No.* 197616-102)**

Response To: Comment 197616-102

The Research and Monitoring Team (RMT) was re-established and tasked with developing a monitoring plan for Northeast NPR-A. This group is proceeding to develop such a plan.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Monitoring Enforcement. The success of mitigation measures is based on the monitoring and enforcement programs that accompany them. The Draft EIS lacks sufficient information to determine if effective monitoring or enforcement would occur. EPA recommends the Final EIS include additional details regarding the Research and Monitoring Team, including its memberships, funding, scope of work, and reporting requirements. We also recommend that the commitment to a fully-funded and functioning monitoring and enforcement program be included in the ROD. EPA recommends that the Final EIS discuss is greater detail how monitoring for compliance with stipulations and ROPs would be conducted and the communication process that would ensure noncompliance is reported and corrected in a timely manner. ***(Comment No.* 197632-009)**

Response To: Comment 197632-009

The decision made in March of 2003, allowed the RMT charter to lapse with the assumption that the newly created North Slope Science Initiative (NSSI) would broaden the scope of management of Federal research and monitoring actions to the entire NPRA.

Comment From: Taqulik Hepa (Comment Letter No. 197988)

The other one is to reinforce the research and monitoring team in full as it was originally intended. To me, it seems like the federal government is stalling on this. You know, it was a great idea that was developed, you know, for the 1998 Plan. It started well off, they had some really good recommendations, then it stopped. You know, it seems like they're stalling because there were really good recommendations that the people of the North Slope thought could help, you know, us, regards to wildlife research and studying the people and the impacts it has on our subsistence lifestyle. So if they could reinforce that real soon and as it was originally intended. ***(Comment No.* 197988-264)**

Response To: Comment 197988-264

The Research and Monitoring Team (RMT) was re-established and tasked with developing a monitoring plan for Northeast NPR-A. This group is proceeding to develop such a plan.

TOPIC: RIGHT OF WAY

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that all roads, trails and historic access routes be shown on all maps and identified with their BLM and/or State of Alaska identification numbers. These should include all trails, whether they qualify as RS-2477s or not. Those that do qualify as RS-2477s should be so identified. An appendix should be included to provide a comprehensive list

of all trails of every type. ***(Comment No.* 196937-010)**

Response To: Comment 196937-010

BLM does not believe there are any valid RS-2477s in the Planning Area. Trails shown on the Alaska Existing Trails System maps of the Planning Area appear to be remnants of winter travel (mostly winter) conducted in conjunction with past oil and gas exploration. These travel routes may have been used only once but showed up on aerial photos and the USGS depictions of those photos used to create the Alaska Existing Trails System maps. These routes do not represent legitimate access as they are unmarked and thus not identifiable in winter and given the wet tundra environment no reasonable person would travel them in the summer.

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 196937)

We ask that all 17(b) access routes be shown on the Plan with their identifying name and number. ***(Comment No.* 196937-011)**

Response To: Comment 196937-011

There is only one 17(b) easement within the boundaries of the Planning Area (EIN 1 C3, D1): an easement for an existing access trail (50) feet in width from Sec. 36, T. 13 N., R. 2 E., Umiat Meridian southerly to public lands. The uses allowed are for travel by foot, dogsled, animals, snowmobiles, two and three-wheeled vehicles, small and large all-terrain vehicles (ATVs), track vehicles and four-wheel drive vehicles. The trail is limited to winter use.

TOPIC: ROADLESS AREAS AND DEVELOPMENT

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 4-31, 1st full paragraph. States that "roadless" development is a requirement of Stipulation 48 in the 1998 EIS. This is not an accurate statement. In fact, stipulation 48 allows roads connecting pads within fields, and roads connecting production sites between separate oil fields. ***(Comment No.* 196557-090)**

Response To: Comment 196557-090

As discussed on page 4-30 of the Draft Amended IAP/EIS, the term "roadless" development does not mean an absence of roads. Rather, it indicates an attempt to minimize construction of permanent roads. Within individual fields, short gravel roads would connect production pads and facilities. These types of roads were also allowed under Stipulation 48 of the 1998 NE IAP/EIS. The impacts of gravel roads, gravel borrow pits, and related surface disturbance are discussed for each resource area in the Draft Amended IAP/EIS. Table 4-26 identifies roads and other facilities using gravel on the North Slope that were evaluated as part of the cumulative impacts analysis.

At this time, a permanent road within the Planning Area is unlikely, especially if oil fields are widely separated within the Planning Area. However, as stated in Section 4.12.1, Scenario for a Possible Permanent Road Within the Planning Area, a permanent road within the Planning Area is possible, even if remote. Thus, the Draft Amended IAP/EIS considered the potential impacts of a 75-mile road from Nuiqsut to the northeastern portion of the Planning Area, and impacts of constructing an all-season road from the Spine Road to near Nuiqsut (as proposed by the Alaska Department of Transportation and Public Facilities), in Section 4.12.3, Effects.

Permanent facilities may be allowed under Lease Stipulation D-2 if the lessee can demonstrate that construction of permanent facilities (e.g., gravel airstrips, pads, and roads) is environmentally or economically preferable to temporary facilities (e.g. ice roads and pads). The potential impacts from permanent facilities have been addressed in the Final Amended IAP/EIS for each resource area under exploration activities.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

This is evidenced by the proposed Alpine Satellite Development plan, in which 4 of the 5 proposed satellites pads, and all of the satellite pads in the NPR-A, would be accessible by a road connected to the Alpine Central Processing Facility ("ACPF"). If the proposed road from the ACPF is built to the CD-6 and CD-7 satellites in the NPR-A, then common sense dictates that it is more likely that the next discovery to the west will be accessed by a road connected to one of these two facilities. The Amended Draft EIS itself acknowledges that reality when it states that development is more likely when it is near existing infrastructure and is less likely to be scattered about using wholly separate facilities. ***(Comment No.* 197616-025)**

Response To: Comment 197616-025

"Roadless" development never meant no roads only that the construction of permanent roads would be minimized; this is still the case. See Chapter 4, Section 4.2.1.2.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

This change in the layout of future development has not been incorporated into the impacts analysis of the Amended Draft EIS. Instead, the analysis of the impacts of potential future development is based on scenarios that, while promising in 1998, are now unlikely. Perhaps the failure of the roadless development concept to live up to its promise is a change in the impacts of oil and gas exploration and development that could justify amending the NE NPR-A EIS/IAP. But, this change would not give the BLM justification to amend the NE NPR-A EIS/IAP to achieve the end results that the BLM apparently seeks from this process. Instead, it could only provide the basis for tightening environmental protections because likely development scenarios will now have greater a footprint, involve more facilities and consequently cause more and greater impacts. ***(Comment No.* 197616-026)**

Response To: Comment 197616-026

"Roadless" development never meant no roads only that the construction of permanent roads would be minimized; this is still the case. See Chapter 4, Section 4.2.1.2.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Transportation: The discussion of roads illustrates the complete failure of this document to fulfill the agency's NEPA and trust responsibilities. The draft IAP/EIS at 4-22 outlines one oil field development scenario that includes 55 miles of permanent gravel road yet BLM continues to refer to this development scenario as "roadless" throughout the document. No matter what BLM labels the 55 miles of road, the environmental consequences of any road are significant and require a complete direct, indirect and cumulative impacts analysis. Dismissing the potential for hundreds of miles of connecting roads, the draft IAP/EIS' permanent road impacts analysis section only addresses the potential for one permanent road to be built (draft IAP/EIS at 4-41 and 4-451) within the planning area and even there dismisses that possibility as unlikely. Continuing this misleading and unrealistic development scenario, BLM asserts that a road connecting the Planning Area to the east is unlikely yet the draft IAP/EIS removes the 1998 ROD prohibition on the construction of roads to outside infrastructure and acknowledges that ADOTPF is currently looking at building such a road (draft IAP/EIS at 4-452). Furthermore the draft IAP/EIS allow roads for exploration (draft IAP/EIS at 2-52) but the environmental consequences section addressing exploration (4-166 and 4-361) fails to acknowledge this fact. This is a significant departure from current North Slope practices and there is no explanation, scientific rationale or impacts assessment completed. ***(Comment No.* 197617-042)**

Response To: Comment 197617-042

See response to comment 196557-090 under Roadless Areas and Development

Comment From: USFWS Anchorage (Comment Letter No. 197619)

The DEIS presents in several places that Stipulations and ROPs proposed under Alternatives B and C will impart resource protection similar to or greater than those currently in place in the Planning Area. Yet, major components of the existing Stipulations would be eliminated under these Alternatives. For example, much of the impact analysis conducted for the 1998 IAP/EIS was predicated upon a "roadless" development scenario that, while permitting in-field roads, prohibited a road connection to existing infrastructure outside the Planning Area. This requirement, which recognizes the potential for significant impacts of increased access in biologically sensitive areas, was incorporated into the 1998 ROD but is not a component of Alternatives B and C in the DEIS. ***(Comment No. 197619-030)***

Response To: Comment 197619-030

We feel Required Operating Procedure E-1 provides an effective and more realistic approach to address the impacts that could result from connecting roads. Stipulation 48 in the 1998 ROD addressed this issue simply by prohibiting such roads; but if such a road were in fact necessary to develop the lease (the right of the lessee) the road could be allowed through the exception process and mitigation developed through the authorization process. Under Required Operating Procedure E-1 we accept that if such a road is necessary it could be authorized and through the authorization process [see section 2.6]we would look at mitigating impacts through design and operational features. An effective operational/design feature could be authorizing industrial use only and requiring gates, patrols and other enforcement measure as a condition of the authorization. Note too that stipulation 48 is a lease stipulation and as such does not apply to intercommunity roads built with public funds for general transportation purposes. Also, see response to comment, 196407-011, and -059 under stipulations and ROPs.

TOPIC: ROADS

Comment From: Kurt Schwarz (Comment Letter No. 182845)

Environmental Stipulations applied to oil and gas activities in NPRA. It would be unwise to repeal the prohibition on building permanent roads during exploration drilling. In the Arctic, even temporary roads pose a serious problem to reclaim when they are no longer needed. The exploration phase is a time to move lightly on the land, because no decision has been made to develop an oil and gas field. ***(Comment No. 182845-004)***

Response To: Comment 182845-004

Lease stipulation D-2 as written in Alternatives B and C, did not require or advocate exploration from newly constructed permanent pads; the stipulation stated that if doing so is more economic it may be allowed. Given the cost of constructing permanent facilities this would rarely, if ever be the case. However, we believed the provision to be necessary because a lease gives the lease holder the right to develop their lease and no Stipulation or Required Operating Procedure should be so costly that the ability to develop the lease is denied. Prior to authorizing any such construction additional analysis would be required and appropriate mitigation developed. It should also be noted that currently (under the 1998 ROD) while the mechanism for approval would be different such a facility could also be authorized through the exception process. In the final Proposed Alternative D, Lease Stipulation D-2 has been modified removing the words "or necessary to carry out exploration more economically."

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 3-114, 2nd paragraph under Proposed Colville River Road from the Kuparuk River Unit to the National Petroleum Reserve – Alaska. This states that the road would be capable of handling drilling rigs. While this is true, it should be made clear that the bridge across the Colville River will not be designed to handle drilling rigs. This would require industry to build an expensive ice bridge every time it needs to move a drilling rig across the river. See also page 4-356. Also in this paragraph there is a reference to Route A – this should be deleted or explained. ***(Comment No. 196557-084)***

Response To: Comment 196557-084

The statements in the document have been revised to 1) reflect the limits on bridge capability and 2)the reference to Route A has been deleted.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 4-23, 2nd paragraph. States gravel roads are typically 62 feet wide toe to toe with 3:1 side slopes. In fact, roads are typically 52 feet wide toe to toe with 2:1 side slopes. ***(Comment No. 196557-089)***

Response To: Comment 196557-089

The text on page 4-23 was corrected to note that gravel roads are 52 feet wide with 2:1 side slopes.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.8.2, Page 4-204, Effects of Disturbances, Oil and Gas Development, Activities on Roads and pads: The first sentence refers to pedestrian traffic on roads and pads. This suggests that pedestrians would not be prohibited from access to these roads. While currently there is no road access to this region, the public and subsistence hunters may use the area to a greater degree if roads are constructed. A thorough analysis of the impacts to natural resources associated with public access or increased subsistence hunting to a currently undeveloped and relatively inaccessible region is needed in the Final EIS. ***(Comment No. 197618-079)***

Response To: Comment 197618-079

"Pedestrians" in this section refers to oil field workers.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.1 1.3.8, Page 4-456, Birds: The potential for a permanent road to lead to increased access and, subsequently, a larger subsistence harvest of birds is understated as it does not mention that the new legal subsistence harvest will allow native and non-native hunters to harvest birds during the spring and summer (in addition to the normal fall hunt). The authors did a good job indicating the differential effect of roads on shorebird species (i.e., intolerant versus tolerant species). ***(Comment No. 197618-113)***

Response To: Comment 197618-113

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 4.11.3.8 Birds, New subsistence harvest laws could increase the potential for impacts to waterfowl in areas where permanent roads allow increased access to subsistence hunters."

Comment From: Taqulik Hepa (Comment Letter No. 197988)

Another big concern I have about any of the Plans is, if you build an industrial road within NPR-A, people are going to find a way to use it. You look at the Dalton Highway; when that was first built that was an industrial road and it was only going to be used for industrial purposes. Today it's a public road. And we have issues there where people -- we have competition for resources: sport hunters, recreational people, tourism, all that stuff is happening. And they want to even make it more accessible for people to hunt from that road. And if you build a road into NPR-A, people are going to come. Whether they say it's an NPR-A -- or an industrial- only, it's going to change. I just know it is because that's what happened in the past with the Dalton Highway. ***(Comment No. 197988-269)***

Response To: Comment 197988-269

The EIS does not consider roads connection outside the National Petroleum Reserve-Alaska.

TOPIC: SEASONAL ROADS AND DRILLING PADS

Comment From: Environmental Coalition (Comment Letter No. 197617)

Furthermore, this section needs to describe the constraints to ice road use. The draft IAP/EIS is not clear at all about how much reliance there will be on ice roads, compared with driving directly on the tundra ("rolling trails" or "off-road travel") or construction of permanent roads. If indeed, access is more likely to be done by driving directly onto the tundra, with hundreds of trips with very heavy loads needed for moving drills rigs, etc., this needs to be explained as one of the assumptions and the impacts of the likely transportation modes need to be discussed fully and associated environmental impacts analyzed fully. ***(Comment No. 197617-046)***

Response To: Comment 197617-046

BLM does not allow summer tundra travel. Furthermore, we believe Section 4.2.1 includes several discussions regarding access including sections entitled "Overland Moves and Other Land Use Permits", "Technology Development", "Logistics, " Seasonal Road and Drilling Pads", "Seismic Surveys", "Exploration and Delineation Wells", "Staging Area", "Gravel Requirements", "Regional Oil Transportation", "Roadless Development" and extensive write-ups under" Development Scenarios".

TOPIC: SEISMIC SURVEYS

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page ES-4, second full paragraph: it is stated here and elsewhere (see page 4-14) that seismic activities, overland moves, and exploratory drilling would all occur only in the winter. Certain mitigation measures would seem, however, to allow drilling and other activities to occur at other times of the year. It should be clarified that such activities will only be permitted during the winter, and all provisions of the document and mitigation measures inconsistent with that restriction must be eliminated. ***(Comment No. 196407-055)***

Response To: Comment 196407-055

There is a distinction between exploration and development activities. Exploration activities (seismic surveys, overland moves, and drilling) occur in the winter over frozen tundra. Some exploration activities could take place in the marine environment during the summer months (such as barge transport, seismic surveys, and perhaps offshore drilling from mobile platforms). Development activities including well drilling, air and perhaps on-road travel, and on-pad construction could occur year-round. Mitigation measures are designed to accommodate these possible activities while providing protection to biological and cultural resources. The Executive Summary is just that—a summary. The complete mitigation package is discussed in section 2.6 (beginning page 2-11).

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-77 through 2-80. Estimates for effects of seismic and ice roads on soils, water quality, vegetation, and wetlands and floodplains are unrealistically high. For example the statement on page 2-78 that "Seismic surveys would cause persistent high-level damage to vegetation..." is erroneous and exaggerated, especially in light of improved attention to environmental protection and improved equipment for seismic surveys and ice road construction. Techniques have greatly improved, and it can only be assumed that the authors are relying on outdated information for making these conclusions. CPAI's experience does not confirm any "persistent high level damage".

Many of the estimates in these sections appear to be speculative and not backed by any scientific data. ***(Comment No. 196557-080)***

Response To: Comment 196557-080

The text in Table 2-3 has been revised to better reflect the types and magnitude of impacts that would occur from seismic surveys.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 4-67, 2nd paragraph. Estimated acreage impacted by seismic lines is high. What recent data are being used to support this conclusion? ***(Comment No. 196557-094)***

Response To: Comment 196557-094

The estimate of damage caused by seismic lines was based on information provided by Emers and Jorgenson (1997) from seismic surveys done in the mid-1980s. As noted by the commenter, this information is somewhat outdated. Information on more recent studies in the Colville River Delta have been included in this section and they show that more modern equipment has less impact on vegetation. Thus, the impacts described on page 4-67 likely overstate the level of impacts that would be expected with more modern equipment.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 4-186, 4th and 5th paragraphs. Estimates of impacts to vegetation from camp move trails and ice pads are high because of erroneous assumptions. For 3D surveys, which are much more prevalent than 2D surveys, camp moves occur down the center of the survey rather than following each of the survey lines, as is done for 2D lines. Therefore a camp move in a 3D survey using the assumed area in this discussion would impact only 1/7 of the area of a camp move for a 2D survey. Also in the third paragraph on page 4-186, the number of miles covered should be 5000 instead of 7500. Additionally, because of new equipment including rubber tracks, there is not a problem with heavy equipment and tight turns. Impacts are less on 3D surveys due to modern rubber tracks, broad designs and load vehicles. As evidenced by recent studies, there is no lasting effect from modern seismic surveys. More recent and applicable data should be used for this analysis. The 1997 study by Emers and Jorgenson was done in the Alaska National Wildlife Refuge at seismic trails that were established decades ago using antiquated techniques. ***(Comment No. 196557-097)***

Response To: Comment 196557-097

The text on impacts to vegetation from camp move trails and ice pads has been modified to account for differences in survey methods and types of equipment use. As noted in Comment No. 196557-094, Seismic, the types and magnitude of impacts described in the Draft Amended IAP/EIS likely overstate the impacts that would be expected using more modern equipment.

Comment From: U.S. Geological Survey (Comment Letter No. 196952)

Page 4-38, Chapter 4: Environmental Consequences, Section 4.2.1.2 Oil and Gas Exploration and Development Activities, Development Subsection Scenarios; Subsection Seismic Operations: The fifth paragraph refers to nearby figure 4-3 showing the location of seismic surveys in the planning area. Seismic surveys conducted in the planning area in 1980 and 198 1 by the USGS/Husky are not shown in figure 4-3 and the text implies that these 'USGS surveys are proprietary, which is not the case. They are publicly available and are referenced below. ***(Comment No. 196952-010)***

Response To: Comment 196952-010

Figure 4-3 has been revised to include information from surveys conducted during 1980 and 1981.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.8.2, Page 4-203, Effects of Disturbances-Exploration: The use of airguns for seismic work in Teshekpuk Lake or other lakes during summer could not only "temporarily displace" birds from preferred habitats but could also prevent them from putting on adequate fat reserves for successful migration. Thus, there could be more far-reaching consequences than simply causing a bird to move to a new area of the lake. Conducting seismic work only in winter months would eliminate this concern. ***(Comment No.* 197618-078)**

Response To: Comment 197618-078

Seismic work would last for a period of only a few days including mobilization and demobilization. The displacement would be temporary. There is no indication that birds using Teshekpuk Lake are limited by habitat so even if displacement were permanent (from the lake) it is unlikely that it would prevent birds from putting on adequate fat reserves for successful migration. If displacement occurred for a few days (or more likely a few hours) there would be little if any impact to the birds energy budget.

Comment From: Inupiat Community of the Arctic Slope (Comment Letter No. 197638)

All around the vicinity of Teshekpuk Lake, subsistence activities that occur during the winter season could be affected by seismic or drilling exploration activities. Such as, impacts to fur-bearing trapping & hunting routes, fishing, and the opportune hunting timeframe for many types of mammals that are harvested by the Inupiat in the area of the NE NPR-A. The deep ruts left in the snow by seismic vehicles creates difficult terrain to traverse, and results in snowmobile wear and tear, including the sleds pulled behind them. ***(Comment No.* 197638-005)**

Response To: Comment 197638-005

Add to end of 4.3.12.2:Subsistence Harvest Patterns section: "In addition to having to travel greater distances to harvest caribou, the disturbance caused to the snow surface by seismic testing, which leaves a trench in the snow, causes an increase in the likelihood that equipment will be damaged or subsistence users potentially injured in crossing the trails (ICAS 2004). Add response letter (ICAS letter of July 20, 2004) to bibliography.

Comment From: Thomas Itta (Comment Letter No. 197979)

Thomas Itta, for the record. A resident of Atqasuk. And he's concerned on fish inlkes and rivers over wintering areas and seismic. Sometime ago they had been involved with the working with seismics before and it has devastated known wintering area near here and Ikpikpuk. And these were these are dynamite things and they know that this does kill and devastates fishes, stocks of fish, many of them and many know over wintering areas. And he's and perhaps on account of those that the setbacks, maybe that may be warranted to be even a little bit more to rather than relaxing them in all the ravines, including rivers. ***(Comment No.* 197979-027)**

Response To: Comment 197979-027

Impacts of seismic on fish are discussed in the EIS. The size of the setbacks were determined by BLM to be appropriate for protection of the resources.

Comment From: Harry Brower (Comment Letter No. 197986)

In the witnessing of the first drill sites that were done near here and the one near Upiksu, when they did the five seismic studies they used dynamite. And these type of incidents have killed stocks of fish. And when that happens, it causes chemical reactions of dead fish in that particular lake. And those fish get unhealthy, sometimes loss of fish in that particular lake due to the stench of the water in that lake from that many dead fish. They don't go back there for more than a season. ***(Comment No.* 197986-333)**

Response To: Comment 197986-333

The industry standard for seismic surveys on the North Slope is currently to use vibroseis rather than dynamite. This has been the practice for a number of years. While dynamite is not specifically prohibited, the current and proposed stipulations and ROPs would preclude the use of dynamite in fish-bearing waterbodies.

TOPIC: SITE CLEARANCE AND REQUIREMENTS FOR ABANDONMENT AND RESTORATION

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Greater attention must be paid in the EIS to issues associated with facility abandonment and site reclamation than was given those topics in the 1998 document. North Slope residents alone will have to deal with the consequences of inadequate requirements dealing with abandonment and reclamation. The 2003 NRC report also reached the conclusion that there has been inadequate analysis of the costs and impacts of the dismantlement and removal of infrastructure and the subsequent restoration and rehabilitation (DRR) of affected North Slope areas. The reporting Committee recommended development of a slope-wide land use plan that reflects an understanding of the likely costs and effectiveness of various DRR approaches.

Like the 1998 Northeast NPR-A Final Integrated Activity Plan/EIS, this DEIS does not adequately address issues associated with facility abandonment, dismantlement and removal of infrastructure, and subsequent site restoration, rehabilitation (DR&R) and reclamation. Some speculation is offered that CPAI could develop plans to dismantle at the time the abandonment phase occurs, but the DEIS does not even attempt an analysis of the needs, costs, or other issues that will factor into the decisions concerning DR&R. In the section describing elements common to all alternatives, for example, an assumption appears to have been made that gravel roads will be left in place upon abandonment. There is no basis for such an assumption. It will likely be required that some sections of road be removed. The potential impacts associated with leaving all roads in place, and with gravel removal and potential reuse, should be discussed. Similar discussion must address the fate of all gravel pads. North Slope residents alone will have to deal with the consequences of inadequate requirements dealing with abandonment and DR&R.

The failure to address this issue at this time results in a lack of information upon which to predict a requirement for financial assurances to ensure that the DR&R can be accomplished. This DEIS is incomplete because it fails to address these issues at all. Road and field abandonment must be fully addressed in the EIS, both in terms of the potential long-term impacts of a failure to fully achieve DR&R, and with respect to the impacts and costs associated with DR&R itself.

Ignoring this issue at this stage may pose an insurmountable obstacle to requiring DR&R in the future if it is determined that a course of action other than "abandonment" is environmentally appropriate. The failure to establish standards, requirements, or conditions at the time the project is approved may preclude the possibility of enforcement of DR&R requirements in the future. It is necessary to carefully analyze the potential need for DR&R and make an effort to articulate conditions now, so that future possibilities of restoring the environment are not foreclosed. ***(Comment No. 196407-049)***

Response To: Comment 196407-049

For Alternatives B (Preferred Alternative) and C, Lease Stipulation G-1 would require upon abandonment that all oil- and gas-related facilities be removed and sites rehabilitated to as near the original condition as practicable, subject to review by the AO. For Alternative A (No Action), Stipulation 58 would provide comparable requirements. The discussion on abandonment on page 4-27 of the Draft IAP/EIS acknowledges that gravel and gravel/sand pads may or may not be removed, depending on such factors as the impacts of removal, future use values for the pad, and the need to recycle and reuse gravel for on-going projects. Specific dismantlement, removal, and restoration requirements would be evaluated in the further NEPA analysis that is completed for each proposed development action. The 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS Record of Decision authorized a Research and Monitoring Team (RMT). The BLM has recently begun a process to replace the original RMT, whose charter was limited to BLM

management of the National Petroleum Reserve-Alaska, with a broader organization with an expanded mission. The BLM has taken a lead role in current efforts to develop a North Slope Science Initiative (NSSI) that would provide a comprehensive and consistent approach to high caliber science across the North Slope. Both the RMT and the NSSI will consider the recommendations of the 2003 NRC report in an areawide context.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

In addition, the EIS should address the General Accounting Office Report, GAO-02-357, entitled Alaska's North Slope: Requirements for Restoring Lands after Oil Production Ceases (June 2002) which concluded that the current DR&R requirements and financial assurances are insufficient to ensure that any federal lands disturbed by oil industry activities will be restored. This report correctly identifies a disconnect between the BLM's overall restoration goal and BLM's recognition that previously improperly plugged wells pose potentially costly environmental problems in the absence of any specific articulated requirements and the minimal BLM bonding requirements in the NPR-A. The report recommended that BLM develop specific DR&R requirements for future oil and gas activity in the NPR-A.

Under 42 USC 6508, oil and gas activities in the NPR-A "shall include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources" of the NPR-A. Even if it is not known at this time if the burden for appropriate DR&R may be lessened in the future because some of the infrastructure may be viewed as desirable at that time, this cannot excuse ignoring the need to assess the possible requirements and costs in this analysis. ***(Comment No. 196407-050)***

Response To: Comment 196407-050

See response to comment 196407-049 under topic Site Clearance and Requirements for Abandonment and Restoration. A short discussion of the findings of the GAO report and implications for oil and gas development in the Planning Area has been added to Section 4.6.7, Abandonment.

Comment From: Environmental Coalition (Comment Letter No. 197617)

VIII. DISMANTLEMENT, REMOVAL, AND RESTORATION (DR&R) BLM has an overall restoration goal of returning the disturbed land to its previous primary uses as fish and wildlife habitat and for subsistence use by native villagers; however, it has yet to develop specific DR&R requirements to implement that goal. In addition, BLM currently uses minimum bond amounts that do not reflect differences in oil company experience and financial viability and are unlikely to cover the potential restoration costs that could be incurred (General Accounting Office. Report to Congress: Requirements for restoring Lands after Oil Production Ceases. Washington: 2002). ***(Comment No. 197617-180)***

Response To: Comment 197617-180

Specific dismantlement, removal, and restoration requirements would be evaluated in the further NEPA analysis that is completed for each proposed development action. For example, the discussion on abandonment on page 4-27 of the Draft IAP/EIS acknowledges that gravel and gravel/sand pads may or may not be removed, depending on such factors as the impacts of removal, future use values for the pad, and the need to recycle and reuse gravel for on-going projects.

Comment From: Environmental Coalition (Comment Letter No. 197617)

In order to ensure that the lands of the Reserve are properly restored after oil and gas activities cease, we recommend BLM issue specific dismantlement, removal, and restoration requirements that will allow BLM to meet its overall goal of returning the land to a condition that will sustain its previous uses including fish and wildlife habitat and subsistence uses. In addition, we recommend BLM review its existing financial assurances for oil and gas activities in the Reserve to determine whether they are adequate to assure the availability of funds to achieve its overall restorative goal. ***(Comment No. 197617-181)***

Response To: Comment 197617-181

See response to comment 197617-180 under Site Clearance and Requirements for Abandonment and Restoration

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative A, Section 4.3.8, Birds. Permanent Habitat Loss, Page 4-1 01. The first paragraph in this section states the development scenario indicates that at abandonment of the field, gravel would not be removed but would be allowed to bed - naturally. However, the subsection, Development Scenarios, beginning on page 4-3 1, does not indicate that gravel will be allowed to remain in place. The document needs to carefully lay out the basic assumptions for exploration and development for all alternatives, and then all discussions use the same assumptions so that an accurate assessment of the potential effects of these activities can be determined. ***(Comment No.* 197620-080)**

Response To: Comment 197620-080

The subsection on Abandonment on page 4-27 of the Draft IAP/EIS states that gravel and gravel/sand pads may or may not be removed, depending on such factors as the impacts of removal, future use values for the pad, and the need to recycle and reuse gravel for on-going projects. The text in Section 4.3.8 has been revised to clarify this.

TOPIC: SOCIOCULTURAL SYSTEMS

Comment From: Kathi Griffin (Comment Letter No. 039278)

Have you read the research on breast milk in Inuit women? Even though they do not "enjoy the benefits of civilization" as we know it, they must endure the irresponsible repercussions of our uncivilized, highly destructive raping of the landscape. ***(Comment No.* 039278-002)**

Response To: Comment 039278-002

Environmental studies have documented that man-made contaminants are being transported to Arctic regions from more industrialized southern regions including pesticides from Southeast Asia, polychlorinated biphenyls (PCBs) from Europe, and mercury from North America. The contaminants are transported through the atmosphere and settle in cold circumpolar regions, where they enter traditional foods, concentrate in fatty tissues, and can be passed on to infants in utero and through breast milk. The Alaskan oil and gas industry currently practices pollution prevention, including the elimination or reduction of discharges to land, air, or water, reduction of chlorinated solvent use, and evaluation of chemicals before use. As worldwide public pressure increases, the use of organochlorine chemicals by global industry has been slowly phasing out; as a result, the levels of these contaminants seem to have been declining. However, recent concerns have been expressed about the environmental hazards of newer contaminants such as brominated flame retardants (polybrominated diphenyl ethers) that have also been found in breast milk and are believed to disrupt hormones in developing children.

Breast milk is made up of fat from a mother's body; therefore, it contains the same chemicals that accumulate in her body fat. Since the mid-1980s, the amount of research conducted on contamination in breast milk of Inuit woman and the potential neuro- and immunotoxic impacts to infants has steadily increased. The first direct evidence of a link was revealed several years ago when researchers demonstrated a relationship between acute ear infections in Inuit infants and the concentration of PCBs and chlorinated pesticides in the breast milk of their mothers (Dewailly et al., 2000). However, the potential human health risks of organochlorine contaminants preferentially sequestered in women's breast milk are still not completely known. Despite this uncertainty, health authorities consistently state that the known immunological and nutritional benefits of breast milk outweigh the unknown risks of low-level contaminant concentrations.

Comment From: patriotic US citizen (Comment Letter No. 149424)

The INUPIAT ESKIMOS HAVE LIVED IN HARMONY WITH THIS LAND FOR 8,000 years, depending upon the area's CARIBOU, GEESE and bowhead WHALES. The administration's drilling plan would reduce protection for the caribou by 75 percent and put that ancient subsistence way of life at risk. **(Comment No. 149424-008)**

Response To: Comment 149424-008

Impacts on subsistence uses from the proposed undertaking are discussed in the EIS in Sections 4.3.12, 4.4.12, 4.5.12.

Comment From: CS Symington (Comment Letter No. 157751)

Further, the proposal would almost completely diminish protection for the caribou -- by estimates of 75 percent. Why in the world would you adopt a plan that is so detrimental to wildlife? The Inupiat Eskimo people rely on the 45,000-member herd for subsistence and have done so for 8000 years. Eliminating their food source is tantamount to genocide. **(Comment No. 157751-003)**

Response To: Comment 157751-003

The BLM recognizes the importance of North Slope caribou herds for subsistence and this is reflected in the Amended IAP/EIS. Stipulations in the Amended IAP/EIS are designed to maintain access to caribou herds in the Planning Area for subsistence hunting, and to ensure the long-term health of the herd. Lease Stipulation K-5 specifically addresses standards that will be applied to permitted activities before these activities can occur in the Teshekpuk Lake Caribou Habitat Area, an area of prime importance to the Teshekpuk Lake Herd caribou. These standards include conducting a minimum of 3 years of studies of caribou movements and habitat use in an area proposed for construction of permanent facilities.

Comment From: Kay Woods (Comment Letter No. 183937)

To allow such activity would have a devastating and permanent negative impact on as many as 60,000 geese and the Inupiat Eskimos' subsistence lifestyle. **(Comment No. 183937-004)**

Response To: Comment 183937-004

The impact on subsistence uses is addressed in the EIS (e.g., sections 4.3.12, 4.4.12, 4.5.12)

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-84, Sociocultural Systems: under Alternative A, oil and gas development in the Planning Area would not simply "further the perception" that local residents are being surrounded by development, and increase the difficulty, expense, and risk of traveling to subsistence harvest areas. Those impacts would be a certainty for Nuiqsut residents, and to a lesser degree, for the residents of other North Slope affected communities. These effects will occur if development expands westward under the No Action Alternative, would be greater under Alternative B, and greatest under Alternative C. Once again, it is unreasonable to conclude that cumulative effects on sociocultural systems would be similar under all three alternatives. **(Comment No. 196407-084)**

Response To: Comment 196407-084

The text in Table 2-3 has been revised to note that these impacts to sociocultural systems are real and that cumulative effects would increase as a result of implementation of the action alternatives. The general effects given under alternatives B and C do recognize that the magnitude and extent of effects would increase as the amount of area developed increases.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-141, last paragraph: we disagree with the conclusion reached in the last sentence of this page that holds that the No Action Alternative would be unlikely to cause further sociocultural impacts because the existing stipulations were developed "in participation" with local communities and the Borough. In the first place, we certainly did not have veto authority over the management plan finalized in 1998. While the consultation process then was far more substantial then for this proposed amendment, planning for the 1998 plan was also rushed and predictably produced a mitigation package that represented a compromise among many diverse interests. In addition, the degree to which post-lease activities may cause sociocultural impacts is dependent upon what is proposed and undertaken, where operations are to occur, and how they are to be conducted. Also, the EIS must not underestimate the degree to which the existence and application of the current exception clause and any such clauses made a part of an amended management plan, are likely to be factors in the social stresses associated with BLM's management of expanding NPR-A development. Uncertainty breeds anxiety. We hear often from oil companies that that predictability in permitting and operating conditions brings them comfort and enhances the likelihood of future development. We share the companies' desire for certainty. You heard that point raised in scoping comments on this proposed amendment, questioning both the need to reexamine a 5-year old management plan, and the proposed shift from prescriptive to performance-based mitigation. Reliance on the current exception clause to apparently allow the placement of a production pad within the Fish Creek buffer as part of the Alpine Satellite Development Project has clearly been a point of contention and anxiety for Nuiqsut residents and others. ***(Comment No. 196407-101)***

Response To: Comment 196407-101

Change last sentence of last paragraph (p. 4-141) to "The No Action Alternative would be unlikely to cause further sociocultural impacts to the communities described in the affected environment; however, the existing and foreseeable impacts of this alternative should not be minimized or discounted depending on what is proposed and undertaken, where operations are to occur, how they are to be conducted, and when they occur. While the existing stipulations and regulations were developed with local participation, the stipulations and regulations were the result of a rushed compromise among diverse interests, no local authority had the power to veto the options, and the stipulations and regulations are too recent to have demonstrated their efficacy, if any, in protecting local resources that contribute to the well-being of local residents. Also, the uncertainty of location, degree, timing, and pace of development results in anxiety among subsistence users of the potentially developed land."

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The conclusion reached in the last sentence on page 4-141 is also inconsistent with statements elsewhere in the document, including the discussion appearing just two pages later. Page 1-143 describes a variety of ways in which industry operations under the No Action Alternative could alter subsistence harvest patterns, thereby affecting sociocultural patterns, increasing social stress, altering relations between communities, increasing racial tensions, increasing incidents of socially maladaptive behavior, and potentially straining "the ability of traditional Inupiat institutions to maintain social stability and cultural continuity." ***(Comment No. 196407-102)***

Response To: Comment 196407-102

See response to comment 196407-101 under Sociocultural Systems

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-143: we question the language employed and conclusions reached in the discussion under Effects of Disturbances. Nuiqsut residents do not merely "perceive" that they are being affected by oil and gas development encroaching from the east, they have been and are affected significantly. Nuiqsut residents do not just have the "perception" that they are being surrounded by development, they are surrounded by development. Nuiqsut residents do not just "perceive" direct connections between the general well-being of their community and subsistence harvests, there is such a connection. The link has been demonstrated by studies of Native health and the consumption of traditional foods, but is also clear in other contexts as well. The statement that "little data currently exists to support

the correlation between oil and gas development and social stress" may be referring to a lack of targeted study of the issue, but ignores clear evidence that industrialization of our North Slope traditional homeland has been and continues to be a source of great stress for the Inupiat people. **(Comment No. 196407-103)**

Response To: Comment 196407-103

Change text in 1st paragraph of Effects of Disturbances (p. 142) to "Nuiqsut is the community in closest proximity to oil and gas development activity. Many Nuiqsut residents have stated in scoping/public testimony that they are being affected by oil and gas development and related activities enveloping the community from the east and excluding them from preferred subsistence harvest areas (Ahtuangaruak 2001). Oil and gas development in the central and southern portion of the Planning Area, as allowed under the 1998 Northeast IAP/EIS ROD, would further surround the community of Nuiqsut and increase the difficulty, expense, and risk of traveling to desired subsistence harvest areas. This development would also divert subsistence users from facilities a distance from 5 to more than 25 miles. This would decrease the use of traditionally used lands by reducing access to these lands and lowering the quality of the experience and connections to the land for Inupiat users. This disconnection from traditional uses threatens the subsistence way of life that is a major component of Inupiat culture. The Alpine Satellite..."

Comment From: Michael Piehl (Comment Letter No. 196572)

The importance of the NPR to native people should be considered. Their traditional lifestyle should always be given preference to development. **(Comment No. 196572-003)**

Response To: Comment 196572-003

The importance of the NPR to Native people is considered in EIS (see ANILCA 810 analysis, Appendix B).

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Amended Draft EIS p. 4-236. The quoted text goes on to say that the "discontinuance of such visits would decrease social cohesion in these communities." This is a pretty dire impact, but we are being told not to worry, the level of protection is the same. **(Comment No. 197616-123)**

Response To: Comment 197616-123

The Final IAP/EIS has been revised in consideration of your comments and the end of Conclusion paragraph (p. 4-236) now reads: "A decline in subsistence harvests, sharing, consumption, intergenerational transmission of values, and land use would threaten a major component of the Inupiat identity as subsistence hunters who exist as integral parts of the environment in which they reside."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The essence of our interests in the management of the Northeast NPR-A stems from our concerns about the sociocultural impacts of changes in the management of the Northeast NPR-A. The health and well being of the residents of Nuiqsut is tied closely to subsistence activities that take place throughout our subsistence range. Subsistence provides sustenance to Nuiqsut's residents.152 But it's more than that, as explained in the Nuiqsut Paisanich: [see comment 197616-160] **(Comment No. 197616-159)**

Response To: Comment 197616-159

The Final IAP/EIS has been revised in consideration of your comments with the following text added to 1st paragraph (p. 141): "As stated in Nuiqsut Paisanich (Brown 1979), 'Today, as in the past, subsistence harvest of wild resources is the central occupation of traditionalist Inupiat. Most of the people in Nuiqsut and other northern Alaska villages are

traditionalists. Despite their acceptance of many elements of Euro-American culture, technology and economy, these people continue to participate in and depend on the subsistence way of life, either as hunters or as sponsors and sharers of the hunt. Subsistence provides such necessities as food and clothing, and it organizes the people's lives seasonally, socially, and ceremonially in the defining patterns of their culture.' Subsistence activities are the vehicle through which culture and values are passed on to the next generation. It is also through the subsistence harvest that successful hunters are able engage in the sharing of meat, a tradition that is a significant part of the Inupiat culture and that is key to the cohesiveness of families and communities."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Today, as in the past, subsistence harvest of wild resources is the central occupation of traditionalist Inupiat. Most of the people in Nuiqsut and other northern Alaska villages are traditionalists. Despite their acceptance of many elements of Euro-American culture, technology and economy, these people continue to participate in and depend on the subsistence way of life, either as hunters or as sponsors and sharers of the hunt. Subsistence provides such necessities as food and clothing, and it organizes the people's lives seasonally, socially, and ceremonially in the defining patterns of their culture.153 ***(Comment No. 197616-160)***

Response To: Comment 197616-160

See response to comment 197616-159 under Sociocultural Systems

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Subsistence activities are the vehicle through which we pass our culture and our values onto the next generation.154 It is also through the subsistence harvest that successful hunters are able engage in the sharing of meat, a tradition that is a significant part of our culture and that is key to the cohesiveness of families and communities. Because of the connections between sociocultural impacts and impacts to subsistence, these are discussed together in our comments. ***(Comment No. 197616-161)***

Response To: Comment 197616-161

See response to comment 197616-159 under Sociocultural Systems

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Amended Draft EIS p. 3-87. Somehow, basic statements of fact like this one in the Affected Environment Section are changed into "perceptions" of Nuiqsut's residents in the Environmental Consequences Section. See e.g. p 4-145 "Nuiqsut residents perceive direct connections between the general well-being of their community and subsistence harvests." This change from fact to perceptions consistently downplays the impacts of oil and gas development on Nuiqsut. ***(Comment No. 197616-162)***

Response To: Comment 197616-162

The Final IAP/EIS has been revised in consideration of your comments. The text on p 4-145 - 4-146 now reads: to "Nuiqsut residents report in public testimony and scoping direct connections between the general well-being of their community and subsistence harvests." Addressed use of the words "perception" and "perceive" throughout subsistence and sociocultural sections in the EIS."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

So, what impacts on our culture does the Amended Draft EIS acknowledge will occur as a result of amending the management of the Northeast NPR-A? According to the Amended Draft EIS, the impacts of Alternative B "would be greater in intensity, area, and duration" than impacts under the current management of the Northeast NPR-A.156

This is a pretty bland statement and gives no sense of the degree of difference in impacts, which surely is a significant part of what any decision-maker needs to know in deciding what is required by the "maximum protection" required by Congress for subsistence, fish and wildlife surface values in the Teshekpuk Lake Special Area.157 Or to decide whether a decision will have the least averse impact as possible on subsistence uses.158 Looking on a little further we see that: [see comment 197616-164] **(Comment No. 197616-163)**

Response To: Comment 197616-163

The Final IAP/EIS has been revised in consideration of your comments with the following text added (p. 4-234 1st paragraph of Effects of Disturbances): "Increases in leased areas and areas open for exploration would have a corresponding increase in the effects to subsistence harvests as compared to those already present in the no-action alternative." We do not have specific information on proposed developments in the planning area nor metric data on the subsistence and sociocultural impacts of rule changes in the NPRA other than what is already included in the EIS."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

This is also pretty uninformative. It tells us that increased activity will occur outside the village which may lead to "increased stress" or a "decreased sense of well being." These are pretty vague concepts and, again, give the decision-maker on the ROD no sense of the difference in impact between the present and the proposed regimes. The impacts of oil development since Prudhoe Bay have been increases in alcoholism, higher levels of suicide and accelerating westernization and acculturation. Talking about those changes and "increased stress" or a "decreased sense of well being" in the same breath practically mocks the impacts that our people and culture are undergoing. Reading the Amended Draft EIS, it almost sounds as though a psychologist and Prozac are suitable mitigation measures. This is nonsense and does not remotely approach the type of analysis and discussion required by NEPA, particularly in light of the decreased level of protections offered by the Preferred Alternative in many areas, as discussed above. **(Comment No. 197616-165)**

Response To: Comment 197616-165

The Final IAP/EIS is vague as there is a data gap regarding sociocultural studies and the relationship between oil and gas development and sociocultural impacts (e.g., social stress and decreased sense of well being). See page 4-142 for a discussion of forthcoming studies regarding the relationship between social stress and oil and gas development. Change text (p. 4-142 last paragraph 3rd sentence) to "Examples of studies…variables; 2) a MMS…subsistence whale hunting activities (EDAW Forthcoming); and 3) the North Slope Borough has submitted a grant request to the State of Alaska for a 'Study of the Cultural, Social, and Economic Impacts to NPRA Subsistence communities Resulting from Current Arctic Oil and Gas Exploration and Production.'" Add to Bibliography: EDAW, Inc. Forthcoming. Quantitative Description of Potential Impacts of OCS Activities on Bowhead Whale Hunting Activities in the Beaufort Sea. U.S. Department of the Interior, Minerals Management Service, Alaska OCS Region Social and Economic Studies Program. Ongoing study.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Unlike the prior uninformative statements in the course of the analysis portion of the sociocultural text, the conclusion of the sociocultural impacts section for Alternative B indicates that there can be impacts on "social cohesion". The conclusion also says that "[a]s harvests decreased, resources would no longer be available in amounts suitable for sharing, resulting in changes in social organization and cultural values."162 We think that this is more like the sociocultural impacts that we are facing, but these are just conclusions. Where's the analysis to support them? Where in the Amended Draft EIS are we told that we can expect our harvest of subsistence resources to drop? How are we told that social cohesion will unravel? **(Comment No. 197616-168)**

Response To: Comment 197616-168

The analysis, such as it is with a lack of data, is in Sections 4.3.12, 4.3.13, 4.4.12, 4.4.14, 4.5.12, 4.5.13. Based on

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Given the absence of real analysis in the body of the sociocultural analysis, we have to wonder what's going on here. It's certainly a lot easier to slip something controversial into the conclusion than to explain the underlying basis for that conclusion in the main part of the section. After all, in the descriptive and analytical parts of the discussion, people expect to see detail and the type of discussion of information that would actually inform a reader. We understand that this is a rush process, as all of BLM's oil and gas-related work on the North Slope seems to be recently. However, the BLM needs to provide that analysis and description and take into account the very real differences in impacts that we have identified in this letter and in our prior scoping letter. ***(Comment No.* 197616-169)**

Response To: Comment 197616-169

See response to comment 197616-168 under Sociocultural Systems

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

What the Amended Draft EIS needs to analyze is how oil and gas activities outside the village are impacting us and how those impacts would be different under the decreased level of protections and the greater development of areas critical to our subsistence resources. Less undeveloped areas means greater concentration of effort in those areas and the potential for conflict within our community and between Nuiqsut and other communities if development in the Northeast NPR-A eventually becomes even halfway as successful and extensive as it has been in the Kuparuk area, let alone the Prudhoe Bay area. We already know that oil and gas activities impact us directly because we are avoiding permanent facilities while hunting. ***(Comment No.* 197616-170)**

Response To: Comment 197616-170

The Final IAP/EIS has been revised in consideration of your comments with the following text added to the end of 1st paragraph (p. 4-410): "Increasing the areas open for leasing and exploration could lead to development in these previously closed areas. Less undeveloped areas means greater concentration of subsistence harvest effort in those undeveloped areas and increased potential for conflict for harvest areas within the community of Nuiqsut and between Nuiqsut and other communities if development increases. Nuiqsut residents state that areas with permanent development are avoided by subsistence users. Effects to subsistence users are already anticipated under existing regulations (e.g., ASDP), and increasing areas open to development will only result in Nuiqsut being surrounded by development."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Alpine Satellite Draft EIS p. 4A.4-1 to 2. The Amended Draft EIS notes the importance of the sharing of subsistence resources but as a manifestation of the cultural value that we place on kinship and family relations. p. 3-88. We think that the quoted passage from the Alpine Satellite Draft EIS more accurately describes the importance of sharing subsistence resources as one of the practices that leads to family and community cohesion. The Amended Draft EIS does not appear to get the connection and in the Unavoidable Adverse Effects Section it concludes that some "cultural values, such as sharing, could be reinforced by shortages in the short term, but could be strained after several seasons of harvest shortages." Amended Draft EIS p. 4-423. ***(Comment No.* 197616-182)**

Response To: Comment 197616-182

The Final IAP/EIS has been revised in consideration of your comments. Added the following text before "Federal..." (p. 4-424): "Long term harvest failures or the loss of a resource would irreparably strain the bonds of sharing and reciprocity that bind the community of Nuiqsut. The loss of the resources that Inupiat people use to define themselves would further distance younger generations from their Inupiat heritage and could cause profound changes in the community." In addition, added the following text to p. 3-88 3rd paragraph): "As discussed in the ASDP EIS (p. 4A.4-1 to 2), the sharing of subsistence foods is essential to the maintenance of family ties, kinship networks, and

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

There is an apparent recent trend towards reduced sharing of subsistence resources in Nuiqsut. We first saw an indication that this was happening in the "Sociocultural Impacts of the Alpine Field on the Colville River Community of Nuiqsut: An Initial Assessment," prepared for Phillips (now ConocoPhillips) by Circumpolar Research Associates ("Alpine Sociocultural Impacts Study").176 That a decline in the sharing of subsistence resources is happening in Nuiqsut is confirmed in the North Slope Borough's 2003 Economic Profile and Census Report (in press). With a reduced amount of sharing already becoming apparent, casual conclusions that "[a]s harvests decreased, resources would no longer be available in amounts suitable for sharing, resulting in changes in social organization and cultural values" just are not acceptable.177 **(Comment No. 197616-183)**

Response To: Comment 197616-183

The Final IAP/EIS has been revised in consideration of your comments with the last sentence in 4.4.13.4 (p. 4-236) changed to read: "In addition, as harvests decrease, resources would no longer be available in amounts suitable for sharing, resulting in a collapse of the sharing and reciprocity ethic of traditional Inupiat culture, threatening Inupiat social organization and violating cultural values."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.6.9.14, Page 4-41 1, Cumulative Analysis, Paragraph 2: This analysis should address the significant threats to the subsistence lifestyles of the Native peoples of western and southwestern Alaska if the proposed encroachment into Goose Molting Area results in a population-level effect on Pacific brant. Similarly, subsistence hunters in interior Alaska could be affected by impacts on the mid-continent white-fronted goose population. **(Comment No. 197618-108)**

Response To: Comment 197618-108

Lease stipulation K-4, Goose Molting Area, would minimize disturbance to molting geese and loss of goose molting habitat in around the lakes of the Goose Molting Area. A discussion of the effects to brant and white-fronted goose from oil and gas development in portions of the Goose Molting Area to Native peoples of western and southwestern Alaska, and subsistence hunters in the interior of Alaska, has been added to Section 4.6.9.14.

TOPIC: SOILS AND PERMAFROST

Comment From: Mary E. Johnston (Comment Letter No. 197634)

I have been quite concerned about the deleterious changes caused in the permafrost areas of Alaska. It is possible the surface is now too soft to support oil drilling and building of oil field roads. Please adopt the "No Action" Alternative on the Teshekpuk Lake Surface Protection Area, this is vital for the wildlife. **(Comment No. 197634-001)**

Response To: Comment 197634-001

As noted in the NRC (2003:102) report, many of the physical effects of oil and gas development can trigger changes in the permafrost active layer. Thus, structures must be designed to avoid thawing their own foundations. Roadways are elevated on thick gravel berms, pipelines are elevated on pilings, buildings are elevated on pilings above thick gravel work pads, and closely space oil wells are cooled by extensive refrigeration equipment to preserve the superficial permafrost that supports them. Information on the effects of oil and gas activities on the permafrost has been included for each alternative and for cumulative impacts under Water Resources.

TOPIC: SPECIAL DESIGNATION AREAS

Comment From: Tom Paragi (Comment Letter No. 143335)

In 1977 the Secretary of the Interior established the Teshekpuk Lake Surface Protection Area and the Colville River Special Area to maintain appropriate environmental protection for fish and wildlife habitat and subsistence resources. The Northeast portion of NPR-A includes the Teshekpuk Lake Surface Protection Area, which contains habitat for wildlife populations of international importance. Teshekpuk Lake has been proposed for a National Wildlife Refuge in the past because it has some of the most productive breeding, staging and brood-rearing habitat for shorebirds and other waterfowl in the entire arctic region of Alaska, including for the Federally-endangered spectacled eider. It is also one of the most important goose and black brant molting areas in North America and provides calving habitat for the Teshekpuk Lake caribou herd. The Colville River Special Area was established to protect raptor and passerine nesting habitats and important foraging areas for moose, grizzly bears, and wolves. Critically important subsistence resources for Nuiqsut and other Native Villages are in both these conservation areas. ***(Comment No.* 143335-002)**

Response To: Comment 143335-002

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Kevin Witt (Comment Letter No. 195444)

In 1977, the Interior Department designated the lake as one of three "Special Areas" within the petroleum reserve requiring "maximum protection" because of their significant natural values. To date, most of the reserve has remained pristine and unmarred by roads, oil rigs another signs of development. This should continue. The current Bush administration's proposal tries to open up 96 percent of the Reserve's northeast region, including much of the Teshekpuk Lake Special Area, to oil and gas development. ***(Comment No.* 195444-003)**

Response To: Comment 195444-003

A good deal of oil and gas activity has occurred over the last 60 years in the Petroleum Reserve (see discussion in Chapter 4 under cumulative impacts). Despite this activity we agree that the Reserve remains largely pristine and unmarred. Given the increased concern to protect surface resources and the improved operating procedures that have evolved since the 1940"s, we believe this condition can be maintained under BLM management even in the face of continued oil and gas activity.

Comment From: Steve Zack (Comment Letter No. 196561)

Special Area designation in the NPR-A was intended to confer protection. The current and recent BLM development plans do not reflect this. The BLM needs to needs to define what Special Areas are and what they mean on the land before subsequent development is laid out. We suggest the BLM formally stipulate specific wildlife protection actions in each of the Special Areas. ***(Comment No.* 196561-004)**

Response To: Comment 196561-004

Each alternative does identify the protections afforded the Special Areas. To understand what these protections are the commenter is encouraged to read Chapter 2 specifically the alternative descriptions (and maps) and the corresponding Stipulations and Required Operating Procedures.

Comment From: Steve Zack (Comment Letter No. 196561)

The concept of and protection afforded by Special Area status in the NPR-A is unclear at best. The history of Special Areas suggest that they be afforded 'maximum protection' consistent with exploration issues. The recent history of

development proposals by the BLM, including the current IAP/EIS, suggests very little consideration for protection. In fact, the 213,000-acre no-lease zone in the Teshekpuk Lake Special Area is clearly too small to encompass the critical habitat needed for waterfowl staging and molt protection as so violates the concept of maximum protection. We suggest that the Department of the Interior make clear just what Special Areas really stand for, and therefore what status and importance the three Special Areas have as development plans continue to encompass the NPR-A. We feel the American public should know up front if these Special Areas really mean anything more than abstract areas on a map. If the concept of Special Areas is to have any real value, their value and protection should be established prior to ongoing development plans. We suggest that the BLM specifically lay out the protection needed for waterfowl staging and molting habitat in the Teshekpuk Lake Special Area, and define the parameters of protection for raptors in the Colville River Special Area. We strongly feel that these Special Areas need be fully protected, their wildlife value asserted formally, and their existing boundaries afford them real protection from development. **(Comment No. 196561-008)**

Response To: Comment 196561-008

See response to comment 196561-004 under Special Designation Areas

Comment From: Arnie Schildhaus (Comment Letter No. 196950)

Such a course of action has the potential to cause devastating impacts in multiple ways to this region and more far-flung locales. Teshekpuk Lake is ecologically unique and one of the most critical wildlife habitats in the Arctic. It provides habitat for molting geese from three nations, nesting birds from six continents, and caribou on which several North Slope communities depend for subsistence. if this wetland wilderness is degraded by industrial scale oil development, the likely impacts on wildlife will be felt in Alaska from Barrow to Hoover Bay and Izembeck Lagoon, in the Lower 48 states, and in Mexico, Canada and Siberia. **(Comment No. 196950-002)**

Response To: Comment 196950-002

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

This is because the BLM had been directed by Congress to manage the NPR-A with such restrictions and prohibitions as are necessary to mitigate adverse impact on surface resources and to provide "maximum protection" to the Teshekpuk Lake Special Area.57 Congress also made clear that it is this nation's policy to manage federal lands in a manner that sustains the subsistence opportunities of Alaska's rural residents.58 The BLM was following these directives from Congress in 1998 when it established the current management plan for the Northeast NPR-A.59 Thus, in order to change that decision, the BLM "must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made." (Emphasis supplied.)60 **(Comment No. 197616-067)**

Response To: Comment 197616-067

See response to comment 196407-006 under topic Purpose and Need and response to comment 196949-011 under topic Special Designation Areas.

Comment From: Environmental Coalition (Comment Letter No. 197617)

In the five years since the release of the 1998 IAP/EIS and ROD, we have accumulated additional information and analyses that require BLM to be more restrictive and protective in the Northeast Planning Area, not less. Despite the growing environmental and social concerns documented in The National Academy of Sciences National Research

Council report Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope, millions of additional acres have been made available to the oil and gas industry on the North Slope without any additional environmental protections. ***(Comment No.* 197617-010)**

Response To: Comment 197617-010

The Proposed Action and all other alternatives presented incorporate many environmental protections, see Chapter

Comment From: Environmental Coalition (Comment Letter No. 197617)

By proposing to remove 75% of the Teshekpuk Lake Surface Protection Area in the draft IAP/EIS Preferred Alternative, BLM is in clear violation of this legislative mandate. There is no new scientific information or rationale to justify this complete reversal from the1998 Northeast ROD. Leasing the entirety of the Arctic Coast without a careful analysis of the impacts and without permanently protecting key areas is unwise and inconsistent with the statute. ***(Comment No.* 197617-015)**

Response To: Comment 197617-015

See response to comments 183937-005 and 196949-011 under Special Designation Areas, 196407-035 under Stipulations and ROPs

Comment From: Environmental Coalition (Comment Letter No. 197617)

FAILURE TO PROVIDE ADEQUATE STIPULATIONS The NPRA 1980 Appropriations Rider on which BLM relies for authority for this action requires that oil and gas leasing activities in the Reserve "shall include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources." 42 U.S.C (6508(1); see also 43 U.S.C. §§ 1701, 1702, 1732. Moreover, the NPRPA requires that the Secretary provide maximum protection to the resources of Teshekpuk Lake and Colville River Special Areas. As in the NEPA documents it prepared for the 1998 Northeast Planning Area, BLM attempts to comply with that requirement in large part by creating a series of conditions and restrictions that should, or might, be included on leases that are issued for oil and gas exploration. In comments submitted with regard to the 1998 Northeast NPRA DEIS, however, we outlined significant shortcomings of the lease stipulations proposed to protect surface resources in that planning area. BLM has not remedied many of those deficiencies, and we reiterate those comments here in reference to the Northeast Planning Area. Moreover, instead of striving to protect resources adequately in the Northeast Planning Area, BLM has proposed significantly weaker and even more discretionary stipulations and Required Operating Procedures (ROPs) in this draft IAP/EIS. Those protections are sufficiently weak and discretionary as to constitute a complete abdication of BLM's responsibility under the NPRPA and a complete failure to provide protection for environmental and socio-cultural resources. ***(Comment No.* 197617-164)**

Response To: Comment 197617-164

See responses to comments 183937-005 and 196949-011 under Special Designation Areas; and 196407-011 and 035 under Stipulations and ROPs.

TOPIC: SPECIAL DESIGNATION AREAS

ISSUE: COLVILLE RIVER SPECIAL AREA

Comment From: Steve Zack (Comment Letter No. 196561)

The Colville River Special Area will also be affected by development. This Special Area is important for its high densities of nesting peregrine falcons, gyrfalcons, and rough-legged hawks. How such proposed development might

affect these species and others in this region of the NPR-A is unknown. **(Comment No. 196561-007)**

Response To: Comment 196561-007

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of raptors in the Colville River Special Area to the potential impacts of oil development.

Comment From: Terry Cummings (Comment Letter No. 196941)

The Colville River is critical nesting ground for raptors. These areas need very strong protection and environmental safeguards. The wetlands, water, lands and wildlife resources need continuous oversight and protection to ensure our unique and fragile arctic environment remains intact. Once gone, it will be lost forever. **(Comment No. 196941-002)**

Response To: Comment 196941-002

As you have pointed out, the Colville River Special Area is important for a variety raptors. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of raptors in the CRSA to the potential impacts of oil development. Specific regulations have been established to minimize the effects the potential impacts of disturbance and habitat loss. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Consistent with the recent Northwest NPR-A Final Integrated Activity Plan/EIS, the Service recommends that leasing of tracts in the Northeast Planning Area within the CRSA be deferred until this area has an approved management plan. When developing that plan, we recommend that the entire CRSA be considered for designation as the Colville River Bird Conservation Area, recognizing the area as supporting the most diverse land bird community in the Alaskan Arctic. Additional recommendations regarding management of the CRSA are addressed below in the Stipulations and Required Operating Procedures and Alternatives sections. **(Comment No. 197619-012)**

Response To: Comment 197619-012

The BLM considered your comments during the development of the Final IAP/EIS.

TOPIC: SPECIAL DESIGNATION AREAS

ISSUE: TESHEKPUK LAKE SPECIAL AREA

Comment From: Carl Wassilie (Comment Letter No. 179814)

The Tekshekpuk Lake area deserves special protection due to the high dependence of the world's waterfowl for molting and nesting. Many animals, including humans, depend on the entire Tekshekpuk Lake ecosystem for survival. **(Comment No. 179814-002)**

Response To: Comment 179814-002

As you have pointed out, the Teshekpuk Lake area is important for a variety of wildlife and for humans. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife to the potential impacts of oil development. Specific regulations have been established to minimize the effects of disturbance to molting waterfowl. In addition, it is likely that pre-development

studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Kay Woods (Comment Letter No. 183937)

In 1977, the Interior Department designated the Teshekpuk Lake Special Area as one of three "Special Areas" within the petroleum reserve requiring "maximum protection" because of their significant natural values. Take all steps necessary to continue to preserve this pristine area that is largely unmarred by roads, oil rigs another signs of development. ***(Comment No.* 183937-005)**

Response To: Comment 183937-005

See response to comment 197977-049 under Global Warming

Comment From: Mary Jo Forman Miller (Comment Letter No. 193978)

The Northeast Planning Area includes the Teshekpuk Lake Special Area, one of the most important wetland complexes in the circumpolar arctic region. It provides nesting and molting habitat for untold numbers of waterfowl, shorebirds and loons, including the greater-white fronted geese and snow geese. The area also serves as the calving grounds for caribou. ***(Comment No.* 193978-004)**

Response To: Comment 193978-004

As you have pointed out, the Teshekpuk Lake area is important for a variety of wildlife including tundra nesting birds, molting geese, and caribou. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife to the potential impacts of oil development. In addition, it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Brenda Wright (Comment Letter No. 195732)

The US Fish and Wildlife Survey conducts annual surveys of the Teshekpuk Lake Surface Protection Area. The surveys of molting geese in the Teshekpuk Lake area document a 15-year mean of 17,570 black brant, 13,001 Canada geese, 7,024 greater white-fronted geese, and 232 lesser snow geese. Total average goose usage for the 199 lake areas surveyed is 37,827 annually. This data highlights the importance of the area not only locally, but globally. Other species that regularly nest in the Teshekpuk Lake area include Northern pintail, long-tailed duck, scaup, scoter, and eider as well as greater white-fronted geese, tundra swan, and loons. Significant populations of these species habitually use the NPR-A and the Northeast Planning area. This habitat is well identified and its integrity should be preserved for continued use by all migratory birds. ***(Comment No.* 195732-003)**

Response To: Comment 195732-003

As you have pointed out, the Teshekpuk Lake area is important for a variety of waterfowl and loons. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife including threatened eiders to the potential impacts of oil development. Specific regulations have been established to minimize the effects of increased predation pressure on tundra nesting birds and the potential impacts of disturbance and habitat loss. In addition, it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Ruth S. Sperling (Comment Letter No. 196041)

The risk to wildlife is simply too great, the consequences too likely to be irreversible. There are a number of wildlife populations that would be affected detrimentally by oil and gas exploration and development in this area, particularly that of the Teshekpuk Lake Surface Protection Area, one of the most important tundra-wetland

ecosystems remaining in the world. Large percentages of the world populations Pacific geese depend on the safety of this area during the molting season when the geese are flightless and vulnerable and, in your preferred alternative, they are entirely unprotected. ***(Comment No. 196041-003)***

Response To: Comment 196041-003

The BLM considered protection of molting geese during development of the final Preferred Alternative. Development is prohibited on 217,000 acres near goose molting lakes in the Goose Molting Area, and development is also limited within the seven lease tracts, an important area north of Teshekpuk Lake that provides habitat for breeding and molting geese.

Comment From: Steve Zack (Comment Letter No. 196561)

The Teshekpuk Lake Special Area is perhaps the most important region of the NPR-A for wildlife. It is a truly unique place in the world. It is clearly the most significant goose molting area in the circumpolar arctic. Up to thirty percent of the Pacific Flyway Brant Geese population molts in this region. This is also an important molting area for Canada Geese, Snow Geese, and White-fronted Geese. There is considerable scientific literature that makes clear these molting geese are easily stressed by anthropogenic disturbance, and that such stress could negatively affect these populations. It is also the major calving ground for the Teshekpuk Lake caribou herd which numbers about 45,000. Further, the Teshekpuk Lake Special Area contains a significant number of the world's population of Yellow-billed Loons, and large numbers of the Federally Endangered Spectacled Eider, plus important populations of other sensitive and/or declining species like King Eider, Long-tailed Ducks, Buff-breasted Sandpipers, and Dunlin. The proposed 213,000-acre no-lease zone is wholly inadequate for protecting this important region and its considerable importance to wildlife. ***(Comment No. 196561-006)***

Response To: Comment 196561-006

As you have pointed out, the Teshekpuk Lake area is important for a variety of shorebirds, waterfowl and loons. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife including threatened eiders and species of concern such as yellow-billed loon to the potential impacts of oil development. Specific regulations have been established to minimize the effects of increased predation pressure on tundra nesting birds and the potential impacts of disturbance and habitat loss. In addition, it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: California Waterfowl Association (Comment Letter No. 196939)

The TLSA supports on the average 14% of the Pacific Flyway's Brant population that migrate to as many as 10 colonies in Alaska and Canada. The TLSA at one time had 30% of the Pacific Flyway black brant molting in this area. Black brant west coast population size continues to fall and is at its lowest recorded level. Disruption of its molting areas may have an impact on its population's ability to rebound in favorable breeding conditions. We note that brant in the Pacific Flyway are important to subsistence hunters on the North Slope, Yukon-Kuskokwim Delta, and Bristol Bay, and also to sport hunters or, the Alaska Peninsula (e.g., at Izezbek Lagoon), from Washington to California, and Mexico. Any significant reductions in numbers of brant could trigger restrictions or closures of both subsistence and sport harvests (Pacific Flyway Council 2002). The TLSA provides also provides molting habitat for white-fronted geese and serves as critical habitat for northern pintail when the southern prairies are faced with drought. ***(Comment No. 196939-002)***

Response To: Comment 196939-002

As you have pointed out, the Teshekpuk Lake area is important for brant, particularly during the molting period. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting brant to the potential impacts of oil development. Specific regulations have been established to minimize the effects of increased predation pressure on tundra nesting birds and the potential impacts of disturbance and habitat loss. In addition, it is likely that pre-development studies will identify

areas that may require special protection or areas important to species of concern.

Comment From: John Dingell, Congress of United States (Comment Letter No. 196942)

According to the Pacific Flyway Council in 1998, "eventual development of oil and gas fields associated with structures and disturbance in or near this area (Teshekpuk Lake) could have significant, long-term impacts on unique habitats used by geese, and the condition and survival of molt-stressed brant. The sensitive goose molting area should not be offered for leasing; it should not be open to construction of roads, pipelines, or other facilities; and seasonal human activity should be restricted, as necessary, to preserve the security of molting geese from disturbance and stress." The Pacific Flyway Council also recommends that the Teshekpuk Lake Special Area be given permanent protection fro m future development by Secretarial designation. **(Comment No. 196942-008)**

Response To: Comment 196942-008

In creating the National Petroleum Reserve-Alaska, Congress gave the Secretary the authority to create special areas within the Reserve and to develop measures to protect significant surface resources within those areas as necessary and consistent with the requirements of the Act for the exploration of the Reserve. The secretary has no authority beyond that granted by Congress to give "permanent" protection.

Comment From: Ducks Unlimited (Comment Letter No. 196943)

It contains unique lacustrine wetland and tundra habitats that are free of human disturbance. **(Comment No. 196943-007)**

Response To: Comment 196943-007

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Ducks Unlimited (Comment Letter No. 196943)

We note that there has been a steady erosion of boundaries of the TLSA, reducing the amount of waterfowl habitat and molting lakes that are given special recognition. We recognize the conservation efforts of the U.S. gas and oil industries in Alaska, including reduced summer activity and helicopter fly-overs of molting areas. However, expanded leasing in the TLSA would degrade critical waterfowl habitat potentially causing detrimental population effects to several sensitive species, more than negatively offsetting the past conservation efforts of the industry. **(Comment No. 196943-010)**

Response To: Comment 196943-010

Your concerns regarding the potential effects of development on waterfowl habitat in the TLSA is legitimate and shared by many others including regulatory agencies. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Michael Graesser (Comment Letter No. 196946)

Many species of birds and mammals depend this area for their survival. Alaska's largest caribou herd, millions of migratory shorebirds, and one of the world's densest populations of nesting birds of prey can all be found here. The threatened species, the Steller's Eider, depends on the TSLA and other sites within the National Petroleum Reserve (NPR) for nesting. For the yellow-billed loon the only significant breeding area in the world occurs within the NPR. The TSLA is also important for tens of thousands molting geese and ducks, as it provides them with crucial habitat for feeding and resting before they begin their annual migration south. Twenty percent of the world's population of Pacific Brandt geese visit this place to molt. **(Comment No. 196946-005)**

Response To: Comment 196946-005

The area is an important wetland that supports large numbers of fish and wildlife as documented in the Final document. Stipulations and Required Operating Procedures are designed to limit impacts in areas where potential development may occur.

Comment From: Pacific Flyway Council (Comment Letter No. 196949)

In the 1980s, your agency established special areas within NPR-A, including the TLSA, to recognize high values to wildlife, yet none of these areas has been given enduring and substantial protection. ***(Comment No. 196949-009)***

Response To: Comment 196949-009

The Teshekpuk Lake, Colville River and Utukok River Uplands Special Areas were established in 1977. Portions of the TLSA and Colville River Special Areas are in the Northeast planning area and are afforded specific protections under each alternative. To understand what these protections are the commenter is encouraged to read Chapter 2 specifically the alternative descriptions (and maps) and the corresponding Stipulations and Required Operating Procedures.

Comment From: Pacific Flyway Council (Comment Letter No. 196949)

Through the 1998 EIS and record of decision, part of the TLSA was deferred from oil and gas leasing, but evaluation of the potential impacts of oil production in this areas was deficient in the EIS, eventual lease sales encroached further into TLSA, and there is still no firm commitment to long-term protection of core goose habitats. ***(Comment No. 196949-011)***

Response To: Comment 196949-011

BLM must manage the Petroleum Reserve according to the relevant provisions of law and regulation. Accordingly, BLM must balance the need to protect surface resources with the requirements of the Naval Petroleum Reserves Production Act (NPRPA) for petroleum exploration. 43 CFR 2361.1 (a) states: "The authorized officer shall take such action, including monitoring, as he deems necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the reserve to the extent consistent with the requirement of the Act [NPRPA] for the exploration of the reserve." Section 104 (a) of the NPRPA says any exploration within the Special Areas shall be conducted in a manner which will assure maximum protection of significant surface values to the extent consistent with the requirements of the Act for the exploration of the Reserve. The legislative history of the NPRPA (House Report No. 94-81 – Part I, page 523) in speaking of Special Areas said that the maximum protection of surface values within special areas "is not a prohibition of exploration activities within such areas . . ." Also see response to comment 186677-010 under Impact Evaluation.

Comment From: Ornithologists (Comment Letter No. 197606)

The Pacific Flyway Council also recommends that the Teshekpuk Lake Special Area be given permanent protection from future development by Secretarial designation. ***(Comment No. 197606-008)***

Response To: Comment 197606-008

In creating the National Petroleum Reserve-Alaska, Congress gave the Secretary the authority to create special areas within the Reserve and to develop measures to protect significant surface resources within those areas as necessary and consistent with the requirements of the Act for the exploration of the Reserve. The secretary has no authority beyond that granted by Congress to give "permanent" protection.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The DEIS fails to provide any scientific analysis or justification for modifying the TLSPA within the TLSA. The TLSA (~ 1.75 million acres) was established by the Secretary of the Interior in 1977 because of its extraordinary fish, wildlife and subsistence values. It encompasses highly vulnerable and important habitats, including a high percentage of wetland and riparian communities and significant wildlife populations, including brant and other waterfowl nesting, molting and staging areas, as well as the calving grounds for the Teshekpuk Lake Caribou Herd. The TLSA is also a particularly important nesting area for threatened spectacled eiders and rare yellow-billed loons. ***(Comment No.* 197610-012)**

Response To: Comment 197610-012

BLM is fully aware of the significant surface resources within the Teshekpuk Lake Special Area; please see responses to comment 183937-005 and 196949-011 under Special Designation Areas, 186677-010 under Impact Evaluation, 196407-006 under Purpose and Need.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The TLSA has significant wilderness and subsistence values and represents an important ecological benchmark for future research and monitoring activities of Arctic wetlands. The BLM (1978) has identified the border of Teshekpuk Lake as an area of concentrated archeological sites. The area around the lake was identified by the US Geological Survey (USGS) as a potential land- and life-form natural landmark (BLM 1978), proposed by Veireck and Zasada (1972) as an ecological reserve, and proposed by Koranda and Evans (1975) as a potential natural landmark. ***(Comment No.* 197610-013)**

Response To: Comment 197610-013

See response to comment 197610-012 under Special Designation Areas - Teshekpuk Lake Special Area

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

In 1998, the Final Environmental Impact Statement and ROD for oil and gas leasing in Northeast NPR-A further recognized the unique values of the TLSA by establishing the TLSPA, as described above. Audubon Alaska's (2002) western Arctic synthesis provided further confirmation that the conservation measures applied to the entire TLSPA were justified on biological grounds and should remain in place. ***(Comment No.* 197610-014)**

Response To: Comment 197610-014

See response to comment 197610-012 under Special Designation Areas - Teshekpuk Lake Special Area

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

If the BLM is going to purport to consider additional environmentally responsible leasing in the Teshekpuk Lake Special Area, it must actually consider the impacts to the environment. The Amended Draft EIS fails in this task because it does not consider the impacts of additional leasing and development on the TLH and on Nuiqsut's subsistence users. ***(Comment No.* 197616-139)**

Response To: Comment 197616-139

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 3.3.7.1 Terrestrial Mammals, Caribou, TLH, Harvest, "Subsistence harvest of the TLH is year-round, with most occurring between July and October by residents of Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Hope, and Wainwright. It is difficult to determine precise numbers for TLH harvest because not all hunters report

their harvest and because most villages harvest caribou from more than one herd. However, by examining village subsistence harvest studies and using radiotelemetry data to determine the percentage of caribou that are in village hunt areas during harvest season, a reasonable estimate can be made of TLH harvest. Approximately 2,500 TLH caribou in 1999-2000, and 2,760 during 2000-2001, were harvested by residents of North Slope villages. Harvest of the TLH by sport hunters is generally low and mostly confined to the Colville River drainage."

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS fails to provide any scientific analysis or justification for modifying the Teshekpuk Lake Surface Protection Area (TLSPA) within the Teshekpuk Lake Special Area (TLSA). The TLSA, approximately 1.75 million acres (708,000 ha), was established by the Secretary of Interior in 1977 because of its extraordinary fish, wildlife, and subsistence values. It encompasses highly vulnerable and important habitats, including a high percentage of wetland and riparian communities and significant wildlife populations, including black brant and other waterfowl nesting, molting, and staging areas, as well as the calving grounds for the Teshekpuk Caribou Herd (TLH). The TLSA is also a particularly important nesting area for threatened spectacled eiders and rare yellow-billed loons. The TLSA has significant wilderness and subsistence values and represents an important ecological benchmark for future research and monitoring activities of Arctic wetlands. The U.S. Bureau of Land Management (BLM) (1978) has identified the border of Teshekpuk Lake as an area of concentrated archeological sites. The area around the lake was identified by the U.S. Geological Survey (USGS) as a potential landform and lifeform natural landmark (BLM 1978), proposed by Veireck and Zasada (1972) as an ecological reserve, and proposed by Koranda and Evans (1975) as a potential natural landmark. ***(Comment No. 197617-072)***

Response To: Comment 197617-072

In addition to the planning area wide Stipulations and Required Operating Procedures, see sections A – J under Alternative D Stipulations and Required Operating Procedures, several area specific measures are incorporated in the Proposed Action that provide significant protection to surface resources within the Teshekpuk Lake Special Area. These measures include deferring Teshekpuk Lake from leasing; creating No Surface Occupancy areas (a) within ¼ mile of Teshekpuk Lake (stipulation K-3) and other deep water lakes (stipulation K-2), (b) within ½ mile or more of goose molting lakes (stipulation K-4) and (c) in important caribou movement and calving areas (stipulations K-9 and K-10); and limiting permanent surface disturbance from oil and gas related development north of Teshekpuk Lake to approximately 0.5 -0.6 % of the lease tract (stipulation K-11). Also see 183937-005 under Special Designation

Comment From: Environmental Coalition (Comment Letter No. 197617)

The Nature Conservancy's Alaska Yukon Arctic Ecoregional Assessment Update #11 distributed in August 2004 further documents the scientific significance of the Teshekpuk Lake Special area. BLM must incorporate this new information in the revised IAP/EIS. In 1998, the Final Environmental Impact Statement and Record of Decision for oil and gas leasing in the Northeast Planning Area further recognized the unique values of the TLSA by designating the Teshekpuk Lake Surface Protection Area (TLSPA) which protected fish and wildlife habitats within an area 857,860 acres in size. This included a 588,998 acre no-lease area and a southern band of 268,861 acres with no-surface activity. This action was taken to protect the unique and sensitive habitat values of that region. Audubon Alaska's (2002) western Arctic synthesis provided further confirmation that the conservation measures applied to the TLSA, including the no-lease and no-surface activity zones, were justified on biological grounds and should remain in place. This position is widely shared by Arctic scientists and the Native people who live on Alaska's North Slope. The draft IAP/EIS proposed action and inadequate analysis allow impermissible impact to the Northeast Planning Area resources and violates this legislative mandate to assure maximum protection. ***(Comment No. 197617-073)***

Response To: Comment 197617-073

BLM must manage the Petroleum Reserve according to the relevant provisions of law and regulation. Accordingly, BLM must balance the need to protect surface resources with the requirements of the Naval Petroleum Reserves Production Act (NPRPA) for petroleum exploration. 43 CFR 2361.1 (a) states: "The authorized officer shall take such action, including monitoring, as he deems necessary to mitigate or avoid unnecessary surface damage and to

minimize ecological disturbance throughout the reserve to the extent consistent with the requirement of the Act [NPRPA] for the exploration of the reserve." Section 104 (a) of the NPRPA says any exploration within the Special Areas shall be conducted in a manner which will assure maximum protection of significant surface values to the extent consistent with the requirements of the Act for the exploration of the Reserve. The legislative history of the NPRPA (House Report No. 94-81 – Part I, page 523) in speaking of Special Areas said that the maximum protection of surface values within special areas "is not a prohibition of exploration activities within such areas . . ." Also see response to comment 186677-010 under Impact Evaluation.

TOPIC: SPILL PREVENTION AND RESPONSE

Comment From: Joe Gutshall (Comment Letter No. 191222)

In the past the oil and gas companies have stated that their invasion of certain areas would not make an impact on the land, however they have not fulfilled their responsibility in this area. I see all of the oil spills and breaks in the oil and gas transfer pipelines listed in the news. This is a frightening thing. ***(Comment No. 191222-002)***

Response To: Comment 191222-002

The Environmental Consequences chapter of the EIS (Chapter 4) examines how activities may impact lands in the Planning Area. Section 4.2.2.1 provides information from the National Research Council report titled Cumulative Environmental Effects of Oil and Gas Activities on the Alaska's North Slope, which determined that the frequency and size of spills has not been sufficient for their effects to have accumulated over time. Section 4.2.2.1 also provides information on reports that indicated a general decreasing trend in the total annual volume of oil spilled over the life of the North Slope oil fields.

Comment From: State of Alaska (Comment Letter No. 197620)

Severe weather conditions in the Arctic can pose unique challenges in cleanup and containment of all spills. The weather also affects the transport and potential impact that a spill may have. Extreme wind and broken ice are two conditions that can affect spills. ***(Comment No. 197620-106)***

Response To: Comment 197620-106

The following text was added to Section 4.2.2.5: "Environmental conditions can sometimes limit response work. Severe weather conditions in the Arctic, such as broken ice and extreme wind, can pose challenges to spill cleanup and containment. Realistic maximum response operating limitations must be taken into account in spill planning (18 AAC 75.425(3)(D))."

Comment From: State of Alaska (Comment Letter No. 197620)

The document should reference to the Alaska Department of Environmental Conservation's requirement that all crude oil transmission pipelines will have leak protection that meets 18 AAC 75 .055 requirements. ***(Comment No. 197620-107)***

Response To: Comment 197620-107

Text has been added to Section 4.2.2.5 and Appendix B, noting that crude oil transmission lines will have leak protection that meets 18 AAC 75.055 requirements.

Comment From: State of Alaska (Comment Letter No. 197620)

Any development in NPR-A may be in close proximity to native population subsistence areas. The document should clarify how and when spill notification to local populations will occur. ***(Comment No. 197620-108)***

Response To: Comment 197620-108

The discussion in Section 4.2.2.5, Spill Prevention and Response, was updated to include local populations.

Comment From: State of Alaska (Comment Letter No. 197620)

4.2.2.5 Spill Prevention and Response should include a statement that each permittee must have certified proof of financial responsibility - 18 AAC 75.240. **(Comment No. 197620-110)**

Response To: Comment 197620-110

Text has been added to Section 4.2.2.5 and Appendix B noting that crude oil transmission lines will have leak protection that meets 18 AAC 75.055 requirements.

Comment From: Arnold Brower Jr. (Comment Letter No. 197986)

On top of that concern, for Bureau of Land Management to supplement the Inupiat Community of Arctic Slope Public Law 93.6.38 contract to -- for ICAS to adjudicate and hire and create an environmental protection agent office for ICAS, which will do the work and reports and other things as necessary when there has been oil and gas spills. And this entity would dispatch the clean-up crew. **(Comment No. 197986-230)**

Response To: Comment 197986-230

See response to comment 197986-226 under Monitoring for Compliance

TOPIC: STIPULATIONS AND ROPS

Comment From: The Wildlife Society (Comment Letter No. 191279)

The 3-mile (~ 400 m) setback for development near goose molting lakes (Lease Stipulation K-4) is inadequate as geese may feed up to several hundred meters from lakes (Derksen et al. 1982). Vehicle disturbance can displace geese within 500 m of roads and compressor noise may prevent geese from feeding within 800 m of production facilities (Madsen 1985, Wisely 1974). The minimum setback should be at least 1 mile from lakes used by molting geese and no development activity should occur in lakes used by molting geese. **(Comment No. 191279-011)**

Response To: Comment 191279-011

The final Preferred Alternative provides protection in the Goose Molting Area by restricting permanent oil and gas activities on approximately 217,000 acres which are utilized by molting geese. The remainder of the area will be restricted to a maximum amount of surface disturbance per lease tract. Please see Stipulation K-4 and K-11 for a complete description of the protective measures developed to protect this resource.

Comment From: The Wildlife Society (Comment Letter No. 191279)

Cliffs along the Colville River and several of its tributaries have long been recognized as nesting habitat for unique concentrations of several raptor species, including arctic peregrine falcons, rough-legged hawks, and gyrfalcons (Kessel and Cade 1958, Cade 1960, White and Cade 1971). The density, diversity, and extent of these breeding raptor populations make the Colville River of international importance, warranting extremely judicious management. Indeed, the National Petroleum Reserves Production Act (NPRPA) requires that activities in the Colville River Special Area "...shall be conducted in a manner which will assure the maximum protection of such surface resources to the extent consistent with the requirement of the Act for the exploration of the Reserve." However, the IAP/EIS does not provide a mechanism for meeting this obligation. **(Comment No. 191279-016)**

Response To: Comment 191279-016

The mechanism for meeting the obligation for providing maximum protection while providing for exploration of the National Petroleum Reserve-Alaska is discussed in Stipulation K-7 – Colville River Special Area.

Comment From: The Wildlife Society (Comment Letter No. 191279)

Second, the Performance-based Lease Stipulations and ROPs for raptors fall short of providing the "maximum protection" required by the NPRPA. None address the disturbance of nesting raptors by exploratory geologists or recreational users, and none require use of specific technology to ameliorate the risk of raptor electrocution (see US BLM 1982, Olendorff et al. 1989, Bevanger 1994, APLIC 1996, Lehman 2001). Finally, the Performance-based Lease Stipulations and ROPs, although admirable for their attempt to protect raptor nesting and foraging habitat, are so subjective that they are impossible to evaluate, monitor or enforce. For example, locating facilities as far "as feasible" from nests and minimizing impacts to habitat unless "there is no feasible or prudent alternative" will mean different things to those trying to maximize protection of raptors and those trying to maximize extraction of petroleum. These are serious shortcomings of the impact evaluation and proposed mitigation measures that must be addressed to adequately examine the potential impacts of the Preferred Alternative (Alternative B). **(Comment No. 191279-018)**

Response To: Comment 191279-018

BLM strongly believes that performance based stipulations and Required Operating Procedures, like those developed to protect Raptors in the Colville River Special Area, and the greater flexibility they offer to adapt requirements/standards to specific situations and to modify the requirements/standards if they prove ineffective, not only are adequate but will increase, not decrease, our ability to protect surface resources and subsistence use. Prescriptive based mitigation often attempts to define a requirement with a one size fits all approach that does not allow adjustments when site and project information is available. The stipulations and Required Operating Procedures that have been developed for the Action alternatives are intended to allow BLM through its permitting and authorization process (see Chapter 2) to use project-specific information (that does not now exist) to refine the requirements and define in the context of the project what such standards as "minimize" or "nonessential" will mean. We believe this is a far more effective approach than to try to define these standards using the "one size fits

Comment From: The Wildlife Society (Comment Letter No. 191279)

The IAP/EIS proposes a set of Performance-based Lease Stipulations and Required Operating Procedures (ROPs) under Alternatives B and C, which if adopted, would replace the stipulations currently in effect. The proposed measures differ from the current stipulations, in that they state a desired management objective, but lack specificity in prescribing the means by which the objective is to be met. The IAP/EIS (Page 2-11) states that the rationale for this approach lies in providing "...BLM and other users, including industry, greater adaptability in protecting surface resources." TWS recognizes the value in providing industry with flexibility in meeting a variety of management objectives; however, as this concept is applied in the IAP/EIS, flexibility comes at the cost of lower standards of protection for wildlife resources. **(Comment No. 191279-034)**

Response To: Comment 191279-034

We disagree that providing flexibility comes at the cost of lower standards of protection for wildlife resources. On the contrary BLM strongly believes that performance based stipulations and Required Operating Procedures and the greater flexibility they offer to adapt requirements/standards to specific situations and to modify the requirements/standards if they prove ineffective, not only are adequate but will increase, not decrease, our ability to protect surface resources and subsistence use. Prescriptive based mitigation often attempts to define a requirement with a one size fits all approach that does not allow adjustments when site and project information is available. The stipulations and Required Operating Procedures that have been developed for the Action alternatives are intended to allow BLM through its permitting and authorization process (see Chapter 2) to use project-specific information (that does not now exist) to refine the requirements and define in the context of the project what such standards as "minimize" or "nonessential" will mean. We believe this is a far more effective approach than to try to define these standards using the "one size fits all" approach

based on hypothetical situations. Conditions imposed on project specific authorizations are every bit as enforceable as lease stipulations.

Comment From: The Wildlife Society (Comment Letter No. 191279)

The proposed stipulations typically instruct lessees to "protect" or "minimize disturbance" to wildlife. While this objective is laudable, the wording is open to interpretation and provides little assurance of benefit to wildlife. It is inevitable that the objective of minimizing impacts to wildlife will conflict to some extent with the implicit objective of facilitating oil and gas development, and in many cases, the proposed stipulations and ROPs provide little or no guidance as to how that conflict will be resolved. For example, while the 1998 stipulation (#53) called for a suspension of helicopter overflights in the goose molting area, the proposed stipulation (K-4.h) states that, "Nonessential helicopter overflights by oil and gas lessees and all other users shall be reviewed and may be suspended...". The proposed substitute stipulation is ineffective because: (1) it is unlikely that any helicopter use would be considered "non-essential" by industry; (2) standards for "review" are not stated; and (3) regardless of the outcome of the review, there is no assurance that overflights will actually be suspended. Similar deficiencies compromise protections for all important wildlife resources. ***(Comment No.* 191279-036)**

Response To: Comment 191279-036

Lease Stipulation K-4.h presented in the Draft has been changed in final Preferred Alternative as follows: Aircraft use

Comment From: The Wildlife Society (Comment Letter No. 191279)

Although TWS recognizes the benefits of maintaining flexibility and adaptability in management, the proposed measures are unworkable. The expectations are unclear to the public, industry, and managers. The objectives and associated requirements/standards are so vague as to make monitoring compliance, and measuring success, impossible. The principles of adaptive management cannot be applied under these circumstances. Further, the current 79 stipulations were developed for the 1998 IAP/EIS through a deliberative, multi-agency process, and discarding them in favor of substitutes developed unilaterally without the benefit of consultation with wildlife scientists outside the BLM is unwise. TWS opposes the proposed change in approach to protecting wildlife and habitat resources. ***(Comment No.* 191279-037)**

Response To: Comment 191279-037

Please see response to comment 191279-006.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Small points in definitions can have big impacts on management. The definition of "consultation" as it is referenced in the stipulations states, in part, that "consultation implies that the BLM or the Lessee/Permittee will contact other agencies or entities to either inform them of potential actions and/or to seek input on noted topics." (page 2-12) This is absolutely unacceptable. One party simply "informing" another of its intentions must never be recognized as consultation. That the definition of consultation now contains that clause is contrary to common usage, and is likely to have been missed by many reviewers. They are likely therefore to have mistakenly believed that consultation requirements necessarily strengthen the package of proposed mitigation measures far more than might be the case with the definition reading as it now does. ***(Comment No.* 196407-026)**

Response To: Comment 196407-026

See response to comment 197980-021 under Consultation with Federal Agencies

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

All of the various NPR-A aquatic habitats, including lakes, streams, nearshore, and river delta habitat require protection. Measures that can effectively protect fish are well understood, but must be strictly imposed and enforced to prevent detrimental impacts. The Draft Amended Plan provides no assurances that such measures will be required. ***(Comment No. 196407-031)***

Response To: Comment 196407-031

BLM believes the Proposed Stipulations and Required Operating Procedures provide many protections for lake, stream, aquatic and nearshore habitats, specifically see ROP A-5, B-1, B-2, C-2, c-3, C-4, E-1, , E-6, E-8, Stipulations D-1, E-2, E-3, K-1, K-2, K-3, K-4, and K-6.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The second sentence in the paragraph at the bottom of page 2-13 is at best unnecessary, and at worst, inaccurate. In referring to the Congressional mandate that oil and gas exploration, development, and production activities in the NPR-A be conducted in a manner that prevents unnecessary surface damage, minimizes ecological disturbances, and avoids conflicts with subsistence activities, the sentence states that "such protection efforts are not intended as a prohibition of petroleum and related activities". It bears noting in this context that other related mandates require that oil and gas activities within a designated special area "shall be conducted in a manner which will assure the maximum protection of such surface resources to the extent consistent with the requirements of [the] Act for the exploration of the Reserve" (42 U.S.C.6504(b), 6508), and that oil and gas activities must include or provide for "conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources of the NPR-A". (42 U.S.C. 6508(1)) It would be more accurate to say that these mandates taken together encourage leasing leading to oil and gas development and production, but envision also that stringent protections, including prohibitions of petroleum and related activities, must be employed where necessary. As we have said, the Borough supports responsible, environmentally and culturally sensitive exploration and development within the NPR-A and elsewhere on the North Slope. Where significant impacts cannot be avoided, however, protection of the environment, fish and wildlife resources, and subsistence opportunities must take precedence over efforts to exploit our region's oil and gas resources. It is not just our hope that the balance is struck in that way; it is the law, and BLM must comply with it. ***(Comment No. 196407-035)***

Response To: Comment 196407-035

42 U.S.C. 6508 in directing the Secretary to conduct an expeditious program of competitive oil and gas leasing says that such a program shall include such conditions, restrictions and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources of the reserve. We do not believe that such protections were intended as a prohibition on oil and gas activities (see response to comment 196949-011 under Special Designation Areas). We also believe that all alternatives developed in the Draft and the Proposed Action do include conditions, restrictions and prohibitions appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources of the Petroleum Reserve and that the alternatives including the Proposed Action comply with the law.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page Executive Summary-3 (ES-3), first paragraph: referring to Alternative B, it is inaccurate and misleading to state, "additional seasonal and spatial stipulations would provide maximum protection of environmentally sensitive areas, including sensitive areas." Clearly, greater protection would be afforded these areas by leaving them off-limits to leasing. ***(Comment No. 196407-054)***

Response To: Comment 196407-054

The statement as written is accurate and simply notes that in addition to the protective measures previously discussed

in the same paragraph, seasonal and spatially specific stipulations have also been developed to protect surface resources in sensitive surface areas (e.g., Special Areas).

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-105, last sentences of the first paragraph under Conclusion: the section should note that stipulations designed to eliminate attraction of predators to camps or equipment maintenance sites may have proven somewhat effective with respect to bears and foxes at Alpine, but have not prevented ravens from nesting at the facility. Given that these ravens must be feeding, it is likely that their presence has resulted in some increase in depredation of the eggs and young of tundra-nesting birds. With respect to the second paragraph of the section, it is unclear how the conclusion was reached that aircraft disturbance of birds would be confined to an area within approximately 2300 feet of summer research camps or clean up sites, with little disturbance beyond 6500 feet. Here, and presumably throughout the analysis of potential aircraft disturbance of birds, there appears to be an assumption that some flight minimum altitude restrictions will be strictly adhered to. There is no such restriction specifically dealing with waterfowl under the current stipulations. In all cases where the document depends on explicitly stated or accepted minimum altitude restrictions as a means of providing adequate protection, there must be research into, and reporting and analysis of the frequency with which such restrictions are not met in cases when meeting them would endanger human life or violate safe flying practices. If restrictions are routinely not met, the potential impacts on birds are obviously far greater. The same analysis should be included for other resources, including marine mammals (see page 4-120, first full paragraph). ***(Comment No.* 196407-096)**

Response To: Comment 196407-096

The Final IAP/EIS has been revised in consideration of your comment concerning predators. The distances within which aircraft disturbance was expected was based on the studies done at the Alpine Field. Altitude minimums are required under stipulations except when weather conditions or other safety factors require lower level flights. There will likely be pre-development studies that will identify areas that may be critical to wildlife and to species of concern where strict adherence to stipulations will be required.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-145, second sentence: the package of mitigating measures contained in the 1998 IAP/EIS Record of Decision was not the result of "several years" of collaboration between communities near the planning area and the local, state, and federal agencies with management interests in the NPR-A. The entire planning process took less than two years, with the bulk of the effort confined to an aggressive 18-month schedule. ***(Comment No.* 196407-104)**

Response To: Comment 196407-104

Change text in 1st paragraph (p. 145) to "Under the No Action Alternative analyzed in this section, the 1998 Northeast IAP/EIS ROD would remain in effect. This package was the result of 18 months of intensive consultation between the communities near the Planning Area and the local, state, and federal agencies with management interests in National Petroleum Reserve-Alaska lands and waters."

Comment From: Conoco Phillips (Comment Letter No. 196557)

A continued ban on leasing of this acreage also prohibits potential exploration and development from occurring in the future when newer technology will be available. Thirty plus years of arctic exploration and development have resulted in significant advances in technology that further minimize impacts to the environment. Technological advances such as ice roads/pads for exploration drilling, low pressure tires for seismic equipment, and extended reach drilling have substantially reduced adverse environmental impacts from oilfield operations, thereby negating the need for total exclusion. It is accepted practice that special stipulations applied during the permitting process are an effective management tool. In fact this "Adaptive Management" process has been embraced by the BLM in this EIS, and we feel that use of this process can mitigate adverse environmental impacts such that the blanket exclusion in Alternative B could be modified. ***(Comment No.* 196557-032)**

Response To: Comment 196557-032

Although industry has made great improvements in technology to reduce impacts from oil and gas exploration and development on the North Slope, some effects, such as disturbances to fish and wildlife populations, and the tendency for subsistence hunters to avoid areas where development has occurred, will likely not be eliminated or substantially reduced by newer technology. Thus, the BLM must consider closing the most sensitive areas to leasing to protect fish and wildlife, subsistence, and other resources that can be affected by disturbance associated with oil and gas activities.

Comment From: Conoco Phillips (Comment Letter No. 196557)

CPAI requests clarification on how BLM will manage stipulations in existing leases. Page 2-34 of the DEIS states "Although lease stipulations may be revised to include more performance-based, rather than prescriptive-based, stipulations as a result of the NEPA process, it is not anticipated that the revisions would create different impacts from what might occur given the current stipulations." (emphasis added). If Alternative B or C is adopted as a result of this current EIS amendment process, we assume that CPAI's leases will be modified to include the new stipulations. We request that the process BLM will undertake for doing so is stated more clearly in the Final EIS. **(Comment No. 196557-042)**

Response To: Comment 196557-042

Section 2.9 that you are referring to on page 2-34 of the Draft EIS has been rewritten to clarify.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Additionally, CPAI suggests adding a discussion of the process for managing lease stipulations for lands currently leased, but later conveyed to Native corporations, and how CPAI's Alpine Satellites Development Project and our request for exceptions to certain of the stipulations will be treated in light of the timing of this process. **(Comment No. 196557-043)**

Response To: Comment 196557-043

If a lease has been issued on lands later conveyed to a Native Corporation we can waive administration with the lease holder's concurrence or make the conveyance subject to the terms of the lease. The Alpine Satellite Development Project ROD was signed prior to completion of this amendment.

Comment From: Conoco Phillips (Comment Letter No. 196557A2)

CPAI requests clarification on how BLM will manage stipulations in existing leases. We request information on the process BLM will undertake for modifying CPAI's leases to incorporate revised stipulations and required operating procedures; we suggest adding a discussion of the process for managing lease stipulations for lands currently leased, but later conveyed to Native corporations; and we request clarification and how CPAI's Alpine Satellites Development Project and our request for exceptions to certain of the stipulations will be treated in light of the timing of this process. **(Comment No. 196557A2-008)**

Response To: Comment 196557A2-008

No changes to the stipulations attached to the existing leases will occur until after consideration in the full NEPA review for the Northeast National Petroleum Reserve-Alaska Amended IAP/EIS and subsequent renegotiations with the leaseholders. Any changes to stipulations attached to existing leases would only be made with the concurrence of the leaseholder.

Any decisions regarding land conveyance or the Alpine Satellite development plan are outside the scope of this amendment process.

Comment From: John Strasenburgh (Comment Letter No. 196951)

The provisions and stipulations of the 1998 document are absolutely necessary in order to protect critical wildlife habitat and subsistence culture. In removing the bulk of these requirements and in eliminating, in particular, the research and monitoring team, you are poised to do serious and permanent damage to a critical area. ***(Comment No. 196951-008)***

Response To: Comment 196951-008

The mitigation measures under the 1998 ROD have been maintained in the proposed performance-based mitigations. Please see Table 2.2

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

Therefore, the AEWC strongly encourages BLM to work with the AEWC to develop stipulations that explicitly address open water season vessel traffic associated with oil and gas development in the NPRA. ***(Comment No. 197605-026)***

Response To: Comment 197605-026

The BLM does not regulate vessel traffic, however, during the authorization process which is required prior to any development occurring, vessel traffic would be addressed. Please see Section 2.6.2.2, General Lease Stipulations and Required Operating Procedures, in the Final IAP/EIS, specifically Stipulation K-6.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

Thus, it is incumbent upon BLM to take all steps necessary to ensure that vessel traffic associated with NPRA leasing is carefully regulated and that all potential impacts are clearly mitigated. ***(Comment No. 197605-055)***

Response To: Comment 197605-055

See response to comment 197605-026 under Stipulations and ROPs

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

Similarly, BLM must carefully implement and evaluate the effectiveness of its mitigation measures for spectacled and Steller's eiders before it can begin to consider making additional areas of the Northeast NPRA available for oil and gas leasing. ***(Comment No. 197605-056)***

Response To: Comment 197605-056

See response to comment 197617-132 under Consultation with Federal Agencies

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

Based on its own analysis, BLM is not in a position to recommend the opening of additional areas of the Northeast NPRA to oil and gas development. At this time, BLM1s focus should be on working with the AEWC, the North Slope Borough, and state and federal agencies to develop, implement, and evaluate mitigation measures necessary to ensure that development on NPRA lands currently subject to oil and gas leasing, in combination with OCS and state leases, does not unreasonably interfere with subsistence uses of the NPRA. ***(Comment No. 197605-057)***

Response To: Comment 197605-057

The BLM believes that the proposed mitigation measures in the final IAP/EIS are sufficient to ensure that activities on National Petroleum Reserve-Alaska lands resulting from oil and gas development do not unreasonably interfere with subsistence uses. In addition the stipulations and ROPs require consultation with local residents to further minimize impacts to subsistence activities. Please see Section 2.6.2.2, General Lease Stipulations and Required Operating Procedures, specifically ROPs H-1 and H-2, and Stipulation K-6.

Comment From: The Nature Conservancy (Comment Letter No. 197609)

The Conservancy has not analyzed the BLM's proposed performance-based stipulations and required operating procedures for their adequacy in ensuring the compatibility of development with adequate protection of these valuable natural resources. Many of the stipulations are designed to mitigate impacts on habitats for certain species during different seasons. It is conceivable, however, that some areas may require closure to development where stipulations fall short of necessary resource protection. Furthermore, in all cases, the BLM can grant exceptions to stipulations if the lessee/permittee can demonstrate to the Authorized Officer's satisfaction that the existing stipulation is technically not feasible, is economically prohibitive, or that an alternative is available that fully satisfies the objectives of the existing stipulation. The resulting lack of certainty of protection increases the risk that we could lose very significant portions of our biodiversity resources. **(Comment No. 197609-018)**

Response To: Comment 197609-018

See response to comment 196407-037 under topic Stipulations and ROPs.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Molting Goose Stipulations and Routine Operating Procedures: In general, performance based stipulations and routine operating procedures provide more room for subjectivity, lack of consistency, and less conservation rigor than prescriptive stipulations2. In comparison to the 1998 plan, we view the changes proposed in the DEIS as a step backward. **(Comment No. 197610-065)**

Response To: Comment 197610-065

See response to comment 196407-011 under topic Stipulations and ROPs.

Comment From: Anadarko (Comment Letter No. 197615)

The BLM should clarify in the final document that not all of the required operating procedures (ROPs) will be imposed on all projects. Those that are to be included as conditions of approval should only be imposed if the site-specific analysis under the National Environmental Policy Act for that project supports its inclusion. **(Comment No. 197615-010)**

Response To: Comment 197615-010

Your statement is correct and we believe it is understood that if, for example, a proposed development is not within the goose molting area stipulation K-4 is irrelevant.

Comment From: Anadarko (Comment Letter No. 197615)

We acknowledge the potential need for set backs to streams and rivers located within the NPR-A. However, we urge BLM to review and address some of the extensive setbacks that would be imposed. In our opinion, the proposed three mile setback is unnecessary. Moreover, it is twice the one and a half mile setback recommended in 1998. **(Comment No. 197615-011)**

Response To: Comment 197615-011

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Anadarko (Comment Letter No. 197615)

It appears that a number of the required operating procedures unnecessarily duplicate existing regulatory requirements imposed by either state or federal agencies. In the draft IAP/EIS, it states that BLM has "eliminated the redundancy of requirements that already exist in the form of regulation or law." IAPEIS at 2-11. BLM should review all of the required operating procedures and include only those that are not duplicative. We have highlighted a few examples of duplicative required operating procedures below. ***(Comment No. 197615-012)***

Response To: Comment 197615-012

Thank you for your comments, but we chose not to eliminate any Required Operating Procedures that may duplicate existing regulations to avoid inconsistency between the Draft and Final documents.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

A third sweeping difference between the 1998 Northeast NPR-A ROD and Alternatives B and C that is not analyzed in the Amended Draft EIS is the elimination of what the Amended Draft EIS calls the "redundancy of requirements that already exist in the form of regulation or law."97 We think that redundancy between the 1998 NE NPR-A ROD and existing regulations and laws is important because regulations and laws can change while those contractual protections would remain in place. These redundancies have special significance to Kuukpik and to the people of Nuiqsut because Kuukpik may end up owning a substantial amount of the land that is currently leased subject to these "redundancies." In the case of future ANCSA selections by Kuukpik of lands subject to these leases, Kuukpik and the Arctic Slope Regional Corporation might well keep such contractual protections in place even if the federal or state law changed.98 The Amended Draft EIS needs to consider what happens if the existing law or regulation is eliminated or weakened. ***(Comment No. 197616-103)***

Response To: Comment 197616-103

Laws and regulations do not need to be restated as conditions of a lease or other land use authorization to be binding and enforceable. Furthermore, BLM cannot impose a requirement on lessee or other permittee that is in violation of law.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The Amended Draft EIS needs to be rewritten to correct these deficiencies everywhere they occur before the BLM can meet its obligation to conduct an analysis of the effectiveness of the ROPs and stipulations proposed under Alternatives B and C. Only then can the BLM have made the required comparison of the effectiveness of the new regime with the effectiveness of the stipulations adopted in the 1998 NE NPR-A ROD.122 Only then should the public be expected to comment on the impacts of the proposed amendment.123 The public must be given another opportunity to comment when these extensive systematic and serious deficiencies are cured. ***(Comment No. 197616-125)***

Response To: Comment 197616-125

See response to comments 196407-011 and 197616-099 under topic Stipulations and ROPs.

Comment From: Environmental Coalition (Comment Letter No. 197617)

In a radical departure from the 1998 Northeast ROD, the proposed stipulations for mitigating impacts from oil and

gas development are harmfully insufficient to protect surface resources and value. The draft IAP/EIS fails to evaluate the effectiveness of the proposed mitigation measures and fails to provide scientific rationale for weakening the stipulations from the 1998 Northeast ROD. Merely listing the mitigation measures is insufficient to qualify as reasoned discussion required by NEPA. **(Comment No. 197617-009)**

Response To: Comment 197617-009

The stipulations and required operating procedures are an integral part of each of the action alternatives. As such the analysis of each alternative is addressing the effectiveness of proposed mitigation; also see response to comment 196407-011 under Stipulations and ROPs.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Primarily, we are concerned that the stipulations and ROPs provided in the draft IAP/EIS for mitigating impacts from oil and gas exploration and development are harmfully insufficient to protect surface resources in the Northeast Planning Area. The decision to remove or weaken those protections violates BLM's duty under the NPRPA and FLPMA to protect the surface resources in the NPR-A. **(Comment No. 197617-166)**

Response To: Comment 197617-166

See responses to comments 196407-011 and 196407-035 under Stipulations and ROPs.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Furthermore, no where in the draft IAP/EIS does BLM define what constitutes an "economically prohibitive" stipulation. What criteria is used to determine if something is economically viable? Virtually every single stipulation and ROP can be waived if deemed economically prohibitive but there is no costs benefit discussion and/or analysis in the document. This is a significant failing. BLM has failed to define the term beyond "a suitable return on investment" (draft IAP/EIS at 7-3). Who determines what profit margin the industry should be afforded at what cost to the public resources? At most, the draft IAP/EIS provides a vague description of the costs. A revised IAP/EIS must detail what criteria will be used to determine what is considered "economically viable". **(Comment No. 197617-169)**

Response To: Comment 197617-169

See responses to comments 196407-011 and 196407-038 under Stipulations and ROPs.

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM claims the stipulations and ROPs will provide on-the-ground protections for surface resources over the entire Northeast Planning Area. BLM, therefore, must conduct a site-specific analysis in order to predict accurately the impacts of these protections. Such analysis must be done before leasing can occur. **(Comment No. 197617-171)**

Response To: Comment 197617-171

See response to comment 197617-038 under NEPA Process

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Page 3, Summary of Impacts: This section states that DEIS analyses assume Stipulations and ROPs would be adopted under each alternative, yet Section 1.7, Decisions to be Made and Implementation (page 1-10) suggests that some of the mitigation measures may not be adopted. Further, Section 2.6.2.1, Stipulation(s) and Required Operating Procedure(s) Exception Process (page 2-14) indicates that exceptions to mitigation measures will be granted if they are considered "economically prohibitive," although criteria for establishing a threshold with regard to

economic impact are not defined. The uncertainties regarding the implementation and effectiveness of Stipulations and ROPs calls into question the degree to which this analysis depends on Stipulations and ROPs to mitigate potential impacts. These uncertainties need to be thoroughly discussed in the final EIS. **(Comment No. 197618-005)**

Response To: Comment 197618-005

The Exception Process applies to all alternatives and is discussed on page II-29 of the 1998 Northeast IAP/EIS and on page 2-14 of the Draft Amended IAP/EIS. The criteria for determining the threshold for economic impact will be evaluated on a case-by-case basis by the Authorizing Officer. In the Amended IAP/EIS, the analysis first evaluates the impacts associated with an activity, and then discusses how stipulations and/or ROPs can mitigate the impact. The effectiveness of each stipulation and ROP is also discussed at the end of each resource evaluation section in Chapter 4, Environmental Consequences, and in Table 2-3 of the Final Amended IAP/EIS.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.9, Page 2-34, Impacts to Current and Future Lease Holders from Revisions to 1998 Northeast IAPIEIS ROD: This section suggests that stipulations attached to existing leases could be revised but that such revisions would not create different impacts "from what might occur given the current stipulations." If tracts currently leased in the no-surface-occupancy area were to have this restriction removed, the Service believes the potential for different and greater impacts along the western and southern edges of Teshekpuk Lake certainly exists. Surface development in these areas, which is currently prohibited, could impact important caribou calving habitat and migration corridors. **(Comment No. 197618-038)**

Response To: Comment 197618-038

Section 2.9 was intended to discuss the impact on lease holders if current lease stipulations were modified to be

Comment From: State of Alaska (Comment Letter No. 197620)

Establish an area with no permanent oil and gas facilities (except a single pipeline corridor) in the critical caribou migration corridor between the Kogru River/Teshekpuk Lake (T14N, R4W; T14N, R3W) **(Comment No. 197620-007)**

Response To: Comment 197620-007

The BLM considered your comments during the development of the Final Proposed Action, see stipulation K-9.

Comment From: State of Alaska (Comment Letter No. 197620)

Establish a 3-mile wide corridor along south and west shores of Teshekpuk Lake and along the coast from Cape Halkett south to the Kogru River where no permanent oil and gas facilities would be allowed unless it can be demonstrated to the satisfaction of the BLM State Director in collaboration with state resource agencies, that proposed oil and gas activities will not negatively impact wildlife resources. **(Comment No. 197620-008)**

Response To: Comment 197620-008

The BLM considered your comments during the development of the Final Proposed Action, see stipulations K-3, K-4,K-6, K-9 and K-10.

Comment From: State of Alaska (Comment Letter No. 197620)

Establish an area (Tl 3 N, R2-5W and northern half of T12N, R2-5W) where no permanent oil and gas facilities would be allowed in order to protect calving caribou unless it can be demonstrated to the satisfaction of the BLM State Director in collaboration with state resource agencies, that proposed oil and gas activities will not negatively impact

calving. ***(Comment No. 197620-009)***

Response To: Comment 197620-009

The BLM considered your comments during the development of the Final Proposed Action, see stipulation K-10.

Comment From: State of Alaska (Comment Letter No. 197620)

Water Use for Permitted Activities We request these mitigation measures include language that acknowledges the Alaska Department of Natural Resources' (DNR) exclusive regulatory authority to approve water withdrawals from surface and subsurface water bodies in Alaska, including water bodies in the NPR-A. This authority is based on the common law doctrine of Public Trust, which is embedded in the Alaska Constitution, Article VIII Section 3, entitled Common Use. The doctrine provides that fish, wildlife and waters within the State must be managed by the State as a public trust for the benefit of the people as a whole. Alaska Statute (A.S.) 46.15 specifically delegates the authority to adjudicate water rights and temporary authorizations for the use of surface and subsurface waters to the ADNR. ***(Comment No. 197620-020)***

Response To: Comment 197620-020

State and Federal regulatory authorities were specifically excluded from mitigation measures. ADNR's authority to approve water withdrawals is referenced in Appendix B.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

EPA supports the concept of performance-based mitigation measures that would provide environmental protections and give the BLM and other land users, including industry, greater flexibility. However, the stipulations and required operating procedures (ROPs) proposed for the Preferred Alternative do not adequately ensure protection of surface resources and subsistence use in the planning Area. Furthermore, the proposed mitigation measures and patterned after those recently adopted in the Northwest NPR-A-ROD, which have not yet stood test of time. No track record has been established to verify and document the success of the performance-based mitigation measures currently in place for the Northwest Planning Area; therefore, it is difficult to use them to adequately predict the effectiveness of the proposed mitigation measures in the Draft EIS. ***(Comment No. 197632-003)***

Response To: Comment 197632-003

The BLM strongly believes that performance based mitigations and the greater flexibility they offer to adapt requirements/standards to specific situations and to modify the requirements/standards if they prove ineffective, not only is adequate but will increase, not decrease, our ability to protect surface resources and subsistence use. Furthermore, if there is some question as to BLM's ability to properly administer oil and gas activities using the

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease Stipulation vs. ROPS. EPA believes many of the proposed mitigation measures would be more effective as lease stipulation rather than ROPS. Leas stipulations represent level of regulatory certainty that is routinely requested by industry. By providing requirements upfront as lese conditions, surface land users, including industry, can efficiently plan and budget for future project design. Recommendations for changing specific ROPs to stipulations are included in Specific Comments subsection below. ***(Comment No. 197632-006)***

Response To: Comment 197632-006

With the signing of a/the Record of Decision, ROPs or Required Operating Procedures become "upfront" requirements for doing business in the planning area. That these requirements are not lease conditions in no way makes them less effective. A lease in itself does not authorize any on-the-ground activity. All on-the-ground activities conducted by a

lessee require additional land-use authorizations (e.g., permits and rights-of-way). ROPs, as conditions of those authorizations (rather than of the lease), will be operating requirements that apply on and off the lease tract. Furthermore, ROPs will be conditions attached to authorizations for activities where the applicant does not have (or need) an oil and gas lease. For example, ROPs will be conditions attached to Special Recreation Permits (guides), permits for geophysical exploration (seismic) and overland move right-of-ways (supply "trains"). Because ROPs: 1. apply to all authorized on-the-ground activities (not just those conducted by a leaseholder), 2. apply to operations on and off a lease tract, and 3. do not represent a legal "taking" (see Section 2.6, Stipulations and Required Operating Procedures, of the Final IAP/EIS) we believe they are more appropriately retained as ROPs rather than lease stipulations.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Mechanisms for Compliance. EPA recommends the Final EIS include additional details for each ROP that explains the authorization(s), permit(s), or other action(s) to which it applies. It is important to describe the types of activities that would trigger each ROP, in order to determine when an ROP must be initiated and determine if the requirements would be more effective as a lease stipulation. The timing of requirements is important to understand in order for effective monitoring and enforcement to occur. It would be helpful to provide a listing of the types of authorizations and permits that the BLM typically processes for activities within the NPR-A, in order to understand when specific ROP requirements would apply. This information could be presented in tabular formats as an additional column in Table 2-2. ***(Comment No. 197632-007)***

Response To: Comment 197632-007

Compliance with Required Operating Procedures: Required Operating Procedures were developed with various mechanisms in place to ensure compliance. These mechanisms include the following:

1) Some ROPs are pre-application requirements, therefore compliance will precede approval of the proposed activity. For example, ROP H-1 (a) requires consultation with affected communities prior to submission of an application for relevant activities within the Northeast Planning Area. If consultation has not taken place, the application will be rejected or will be considered incomplete until such time the consultation has occurred.

2) Other ROPs are required design features, and would have to be incorporated into the applicant's proposal. As an integral part of the proposal and the authorization, the requirement does not need to be stipulated to be enforceable. For example, a minimum pipeline height of 7 feet for above ground pipelines is a required design of any approved above ground pipeline (ROP E-7). Since the authorization (a ROW in this case) authorizes a pipeline with a minimum height of 7 feet, anything less (unless specifically approved through additional NEPA analysis and the permit) is not

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Effectiveness of Stipulations and ROPs. The performance-based stipulations and ROPs included in the Preferred Alternative are revisions to the 1998 Northeast NPR-A ROD stipulations and are patterned after stipulations and ROPs that were recently adopted in the Northwest NPR-A ROD. We recommend that the Final EIS report on the implementation and effectiveness of the stipulations that are in effect for the Northwest NRR-A ROD. The information would disclose to the public and decision maker the likely outcomes of the use similar mitigation measures in the Northeast Planning Area. We also recommend that the Final EIS discuss how specific stipulations in the 1998 ROD have not provided effective mitigation or have created an unnecessary restriction or impediment to surface activities, such s resource development, so the public and decision maker can understand the rationale behind the proposed revision. ***(Comment No. 197632-008)***

Response To: Comment 197632-008

The NW Record of Decision was only signed in January of 2004, since that time there has been very little commercial activity in the Northwest Planning area. Thus, there has been little opportunity to use the Stipulations and ROPs developed through that planning effort. However, BLM is confident that the new performance based approach is a

better way of doing business. Accordingly, we wish to implement this approach in the National Petroleum Reserve-Alaska where oil and gas exploratory drilling and development are occurring. Also, see response to Comment No. 197632-003, Stipulations and Required Operating Procedures.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Basis for Numerical Requirements. The Final EIS should describe how specific numerical requirements such as set-back distances, buffer zone areas, dates, and aircraft altitudes were developed for stipulations and ROPs. EPA recommends that the descriptions include the appropriate references or other information sources that were used to determine each numerical requirement. ***(Comment No.* 197632-011)**

Response To: Comment 197632-011

The specific numerical requirements such as setback buffer zones, dates, and flight altitudes that are contained in the stipulations and required operating procedures for the 1998 Northeast NPR-A IAP/EIS, the 2004 Northwest NPR-A IAP/EIS, and this final amended document were established based on the experience and professional judgment of experts from BLM in consultation with the USFWS, the Alaska Department of Fish and Game, the Minerals Management Service, the North Slope Borough, academia and industry. Specific examples are ROP F-1.a, flight restrictions were developed in consultation with USFWS (letter dated May 26, 1995) following delisting of arctic peregrine falcon on October 5, 1994. In February, 1999, at a BLM sponsored workshop a panel of raptor experts thought the requirement to be adequate. Workshop panelists came from ADFG, USFWS, USGS, the North Slope Borough, and included university and industry biologists. These restrictions were expanded as a result of that workshop. ROP F-1.b was developed following the 1983 leasing EIS. There exists at least one study (Calef, G., E. DeBock, and G. Lortie. 1976. The reaction of barren-ground caribou to aircraft. Arctic 29:201-212) describing the

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Stipulations That Apply in Biologically Sensitive Areas. EPA recommends that the stipulations in this section be revised to align with our recommendation to develop and analyze a modified Preferred Alternative that maintains the current status of lands unavailable for leasing or under No Surface Activity restrictions. ***(Comment No.* 197632-026)**

Response To: Comment 197632-026

The BLM considered your comments during the development of the Final Proposed Action and several stipulations applicable to biologically sensitive areas have been added. See K-9, K-10 and K-11.

Comment From: Leonard Lampe (Comment Letter No. 197973)

So, I recommend to the federal government, BLM, to work with the local people on the mitigation measures, and I thank you for your time. Thank you. ***(Comment No.* 197973-054)**

Response To: Comment 197973-054

See response to comment 197980-015 under NEPA Process

Comment From: Paul Hugo (Comment Letter No. 197974)

As we all know this we are not entitled to NPR-A impact funds, which would have been very beneficial to our community. Currently, it is only the communities that are within the NPR-A that are entitled to receive those funds. I would not support any changes to the existing prescriptive mitigation structure to the proposed performance-based structures unless we can be assured that all protections provided by the 79 stipulations of the 1998 Plan are preserved or enhanced. ***(Comment No.* 197974-157)**

Response To: Comment 197974-157

Please see Table 2.2 for a complete description of the comparison and effectiveness analysis of the 79 prescriptive stipulations and Alternatives B, C, and the Final Preferred Alternative D.

Comment From: Charles Brower (Comment Letter No. 197980)

All protections afforded by the existing prescriptive mitigation measures must be carried forward if there is a shift to performance-based mitigation. We will not support a change from existing prescriptive mitigation structure to the proposed performance-based structure unless we can be assured that all protections provided by the 79 stipulations of the 1998 Plan are preserved or enhanced.

Response To: Comment 197980-019

Those stipulations that do not have a corresponding new performance-based stipulation or ROP already exist in the form of regulation or law. In those instances, the existing law or regulation has been noted.

TOPIC: STIPULATIONS AND ROPS

ISSUE: A-2

Comment From: Anadarko (Comment Letter No. 197615)

ROP A-2: This required operating procedure (ROP) mandates that lessees prepare a comprehensive waste management plan that is to be submitted to the authorized officer for approval. The requirement is unnecessarily duplicative of existing regulatory requirements imposed by other federal and state agencies. We recommend that BLM modify the requirement to remove those provisions, such as disposal of pumpable waste products, which are addressed by other applicable regulations. ***(Comment No. 197615-014)***

Response To: Comment 197615-014

See response to comment 197615-012 under topic Stipulations and ROPs.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Criteria that would be used to determine if objectives of specific Stipulations and ROPs are met are not defined. For instance, the objective of ROP A-2 is to avoid human-caused changes in predator populations, which implies the need for sound pre-activity baseline data on predator populations; yet collecting baseline data is not a requirement. Requirement/Standard (a) of this ROP states: "All feasible precautions shall be taken to avoid attracting wildlife to food and garbage," yet it does not indicate what course of action would be taken if predator numbers increase in association with leasing or development activities despite feasible precautions. That is, it does not describe an adaptive management approach that would be used to correct such a situation. Although North Slope operators have, with the encouragement of resource agencies, implemented measures to reduce the availability of artificial nesting or denning structures and anthropogenic food sources, these measures have not been completely effective, as evidenced by the continued nesting of ravens on permanent and temporary structures and the persistence of unusually large concentrations of gulls associated with human activities. ***(Comment No. 197619-032)***

Response To: Comment 197619-032

See response to comments 196407-011, 059 and 065 under stipulations and ROPs.

TOPIC: STIPULATIONS AND ROPS

ISSUE: A3

Comment From: State of Alaska (Comment Letter No. 197620)

Waste Prevention, Handling, Disposal, Spills, and Public safety ROP A-3 and A-4, Pane 2-1 6. A-3 requires a Hazardous Materials Emergency Contingency Plan before transportation, storage, or use of fuel or hazardous substances. A-4 requires a Comprehensive Spill Prevention Plan before initiating any oil and gas related activity. There appears to be some redundancy in these two plans as they apply to oil and gas related activities. BLM may want to consider combining the requirements of the two plans into a single plan requirement that satisfies the objectives ROPs A-3, A-4, and A-5. ***(Comment No. 197620-017)***

Response To: Comment 197620-017

We considered your comment in developing the Proposed Action but chose to keep Hazardous-materials contingency planning a separate objective.

TOPIC: STIPULATIONS AND ROPS

ISSUE: A-4

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-16, A-4b: the ROP represents a weakening of existing Stipulation 14. The current measure requires use of an impermeable diked area for storage of a single tank in excess of 660 gallons or multiple tanks in excess of 1320 gallons. The proposed ROP only requires use of a lined and diked area for storage of materials in excess of 1320 gallons. The single tank 660-gallon threshold for lining and diking should be maintained ***(Comment No. 196407-058)***

Response To: Comment 196407-058

The 660-gallon threshold was taken out to be consistent with regulations which were changed to eliminate this requirement.

Comment From: Anadarko (Comment Letter No. 197615)

ROP A-4: This ROP requires a lessee to develop a comprehensive spill prevention and response contingency plan in accordance with 40 C.F.R. 112. Lessees must already prepare such a plan under existing regulations, and including this requirement as a ROP is unnecessarily duplicative. Moreover, subparagraph (b) seems to imply that even if a lessee has a permit authorizing a discharge into marine waters, BLM could still prohibit such a discharge. Such a decision is beyond the scope of BLM's authority, and we recommend that BLM revise the ROP to delete this provision. ***(Comment No. 197615-015)***

Response To: Comment 197615-015

We do not find a reference to discharge into marine waters under ROP A-4. Also see response to comment 197615-012 under topic Stipulations and ROPs.

Comment From: State of Alaska (Comment Letter No. 197620)

Waste Prevention, Handling, Disposal, Spills, and Public safety ROP A-3 and A-4, Pane 2-1 6. A-3 requires a

Hazardous Materials Emergency Contingency Plan before transportation, storage, or use of fuel or hazardous substances. A-4 requires a Comprehensive Spill Prevention Plan before initiating any oil and gas related activity. There appears to be some redundancy in these two plans as they apply to oil and gas related activities. BLM may want to consider combining the requirements of the two plans into a single plan requirement that satisfies the objectives ROPs A-3, A-4, and A-5. ***(Comment No. 197620-017)***

Response To: Comment 197620-017

We considered your comment in developing the Proposed Action but chose to keep Hazardous-materials contingency planning a separate objective.

Comment From: State of Alaska (Comment Letter No. 197620)

ROP A-4b, Storage Containers, Pane 2-1 6. This mitigation measure indicates that fuel and other petroleum products shall be stored at approved locations. The ROP should also reference setback requirements (100 ft from non fish-bearing waters and 500 ft from fish bearing waters) for hazardous materials storage from fish-bearing and non-fish-bearing waters. ***(Comment No. 197620-018)***

Response To: Comment 197620-018

We will set the appropriate distance as part of the CSPRP as per A-4(b).

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Waste Prevention, Handling, Disposal, Spills and Public Safety. EPA recommends that the spill prevention, response and reporting requirements remain lease stipulations due to the heightened concern by residents in North Slope villages and the adverse impacts that result from spills. In addition, requirements that address public safety should be lease stipulations, to ensure leases are notified of these requirements prior to planning any activities within the Planning Area. ROP A-4: EPA recommends that minimum set-back distance from water bodies be included for storage containers that contain fuels or other hazardous substances. Containers should also be marked with the Operator's name, for identification. ROP A-7a.: EPA recommends that consultation with ADEC and EPA be conducted prior to authorizing alternate disposal methods for produced fluids. ***(Comment No. 197632-013)***

Response To: Comment 197632-013

The BLM believes these requirements are more appropriately left as ROPs; With the signing of a/the Record of Decision, ROPs or Required Operating Procedures become "upfront" requirements for doing business in the planning area. That these requirements are not lease conditions in no way makes them less effective. A lease in itself does not authorize any on-the-ground activity. All on-the-ground activities conducted by a lessee require additional land-use authorizations (e.g., permits and rights-of-way). ROPs, as conditions of those authorizations (rather than of the lease), will be operating requirements that apply on and off the lease tract. Furthermore, ROPs will be conditions attached to authorizations for activities where the applicant does not have (or need) an oil and gas lease. For example, ROPs will be conditions attached to Special Recreation Permits (guides), permits for geophysical exploration (seismic) and overland move right-of-ways (supply "trains"). Because ROPs: 1. apply to all authorized on-the-ground activities (not just those conducted by a leaseholder), 2. apply to operations on and off a lease tract, and 3. do not represent a legal "taking" (see Section 2.6, Stipulations and Required Operating Procedures, of the Final IAP/EIS) we believe they are more appropriately retained as ROPs rather than lease stipulations.

TOPIC: STIPULATIONS AND ROPS

ISSUE: A-5

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-16, A-5: the final clause would allow the AO to allow exceptions to the setback requirements if storage and refueling operations are "properly designed to account for local hydrologic conditions". The ROP is deficient in at least two respects. No criteria are given that would be used by the AO in making that determination. No consultation with other agencies or local communities is required. ***(Comment No. 196407-059)***

Response To: Comment 196407-059

The flexibility built in to many of the Stipulations and Required Operating Procedures is not to be construed as an additional exception process but as a mechanism to address resource issues based on project-specific information; see responses to 196264-006, 196407-015, 037 and 038 under Stipulations and Required Operating Procedures. Prescriptive based mitigation often attempts to define a requirement with a one size fits all approach that does not allow adjustments when site and project information is available. The stipulations and Required Operating Procedures that have been developed for the Action alternatives are intended to allow BLM through its permitting and authorization process (see Chapter 2) to use project-specific information (that does not now exist) to refine the requirements and define in the context of the project what such standards as "properly designed to account for hydrological conditions" will mean. We believe this is a far more effective approach than to try to define these standards using the "one size fits all" approach based on hypothetical situations. Necessary consultation with other agencies and local communities will occur as part of the permitting process.

Comment From: State of Alaska (Comment Letter No. 197620)

ROP A-5. Refueling Page 2-16. The boundary change from the highest high water mark to the active floodplain may present compliance difficulties, e.g., delineating the floodplain during winter exploration operations, proximity to other active floodplains, and the possibility of displacement into more undesirable locations. In addition, certain circumstances (e.g., crane operations for bridge placement) will require exceptions to setback requirements for safety and logistical reasons. ***(Comment No. 197620-019)***

Response To: Comment 197620-019

We believe that despite any difficulties that may arise in delineating the active floodplain it is a more appropriate benchmark.

TOPIC: STIPULATIONS AND ROPS

ISSUE: A-6

Comment From: Anadarko (Comment Letter No. 197615)

ROP A-6: This ROP prohibits the surface discharge of reserve pit fluids unless the lessee has an applicable federal, state and/or local permit. This requirement seems unnecessarily duplicative of already existing regulations; therefore, we recommend that it not be included in the ROD. ***(Comment No. 197615-016)***

Response To: Comment 197615-016

See response to comment 197615-012 under topic Stipulations and ROPs.

TOPIC: STIPULATIONS AND ROPS

ISSUE: A-8

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.6.2.2.A, Page 2-17, A-8 ROP (and Table2-2, Page 2-75): Because the Incidental Take Program is the primary method by which the Service monitors bear-human interactions and potential effects of industrial activity on polar bears, we recommend the following Requirement be added: "h. Consult with USFWS before initiating oil and gas-related activities within 25 miles of the coast to determine polar bear activity in the area. Operators should obtain a Letter of Authorization from the USFWS prior to conducting activities in polar bear habitat." The recommended language reflects the Service's intent to encourage compliance with and participation in the Incidental Take Program, previously identified in the No Action Alternative under Stipulation 77 (see pg. 2-75). ***(Comment No.* 197618-022)**

Response To: Comment 197618-022

We do have such a requirement under Required Operating Procedure C-1.

TOPIC: STIPULATIONS AND ROPS

ISSUE: B-2

Comment From: State of Alaska (Comment Letter No. 197620)

ROP B-2, Page 2-1 7. Please note that under the exception provision, the figures in this mitigation measure may warrant further adjustments by permitting agencies based on completion of further fish studies and future acquisition of more complete or detailed information.

Response To: Comment 197620-021

Based on discussion with AK DNR ROP B-2 has been modified in the Final Proposed Action.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 2, Alternatives, Section 2.6, Stipulations and Required Operating Procedures, B. Water Use for Permitted Activities, Page 2-1 8. Under B-2g, approval of fish screening devices is currently performed by the Alaska Department of Natural Resources (ADNR), Office of Habitat Management and Permitting (OHMP). This responsibility was transferred from the Alaska Department of Fish and Game (ADF&G) in 2003. ***(Comment No.* 197620-048)**

Response To: Comment 197620-048

We have made the appropriate change to ROP B-2 in the Final Proposed Action.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Water Use for Permitted Activities. ROP B-2: EPA recommends that appropriate consultations federal, state, and North Slope Borough regulatory and resource agencies be added to this ROP. ***(Comment No.* 197632-014)**

Response To: Comment 197632-014

Appropriate consultations will occur if necessary as determined during the permitting authorization process.

TOPIC: STIPULATIONS AND ROPS

ISSUE: C-2

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-19, C-2a: to be clear that heavy equipment used in the construction of ice roads will not be permitted to damage stream banks, compact soils, or cause the breakage, abrasion, compaction, or displacement of vegetation, this ROP should be revised to read "ground operations shall be allowed only when frost and snow cover is at sufficient depths to protect the tundra, taking into account the specific vehicle(s) proposed for use." **(Comment No. 196407-060)**

Response To: Comment 196407-060

It is not clear how this clarifies C-2 a, the introduction to Section C says the following ROPs apply to overland moves, seismic work, and any similar cross-country vehicle use of heavy equipment on non-roaded surfaces.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-19, C-2b: should be amended to read "With the exception of heavy equipment used during construction of ice roads that is governed by C-2a above, only low-pressure vehicles...." **(Comment No. 196407-061)**

Response To: Comment 196407-061

It is not clear how this clarifies C-2 b. Underlined as part of C-2 b is the statement that the provision does not include the use of heavy equipment such as front-end loaders and similar equipment required during ice road construction.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Winter Overland Moves and Seismic Work. EPA recommends that the BLM develop and ROP that addresses local residents' concerns regarding snow and ice ruts that are created during seismic operations. ROP C-2(d) appears to partly address the issue; however, it lacks definition of what "superseding environmental concerns" means. Encountering ruts in snow and ice during overland travels a serious safety issue for local residents that should be addressed in this ROP. **(Comment No. 197632-015)**

Response To: Comment 197632-015

The potential for some "ruts" to develop in the snow from overland travel is unavoidable. One purpose of the consultation requirements under Required Operating Procedure H-1 and H-2 is to inform local residents where and when oil and gas activities will be occurring so that problem areas can be identified and measures taken to avoid

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

EPA recommends that results of the Alaska Department of Natural Resources tundra travel studies, which should be available in November 2004, be reviewed, evaluated, and incorporated into the ROPs, in order to provide updated information regarding environmental protections for overland travel in the sensitive tundra environment. **(Comment No. 197632-016)**

Response To: Comment 197632-016

The BLM mitigations establish the criteria that Tundra Travel would only take place in the winter season. Our overland moves and seismic work mitigation ROP C-2, is specifically focused on not damaging the tundra. The DNR study you refer to focused on the impact of various types of vehicles traveling on the tundra in the winter. We will certainly take the results of this and other studies into consideration when making tundra travel decisions and/or adjusting our requirement/standards to provide protection to the tundra. The performance-based approach to mitigating impacts are designed specifically to allow us to make those adjustments when new information, like the ADNR tundra travel study, comes into play.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

ROP C-2: This ROP does not address potential impacts to riparian zones. EPA recommends clarifying the application of this ROP to work near water bodies and specifying a prohibition for altering banks of waterways (see 1998 ROD, Stipulation 22). We also recommend this ROP clarify how it compares to special protections needed in the Colville River Special Areas. ***(Comment No. 197632-017)***

Response To: Comment 197632-017

The objective statement clearly states to protect stream banks and parts a-e provide standards to accomplish the objective. We do not understand comment to clarify how it compares to Colville River Special Areas. See K-1(a) and K-7.

TOPIC: STIPULATIONS AND ROPS

ISSUE: C-3

Comment From: State of Alaska (Comment Letter No. 197620)

Winter Overland Moves and Seismic Work ROP C-3, Protection of Water Quality, Page 2-19. This measure should be modified to note that, except for approved crossings, alteration of the banks of a waterway is prohibited; clearing of willows along the riparian zone is prohibited; and movement of equipment through willow stands shall be avoided whenever possible. ***(Comment No. 197620-022)***

Response To: Comment 197620-022

We think these issues are addressed by ROP C-3 and C-2.

TOPIC: STIPULATIONS AND ROPS

ISSUE: D-1

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-19, D-1: this is a clear example of what is wrong with many of the proposed mitigation measures. It represents a significant weakening of the comparable existing Stipulation 28. The fatal flaw of the measure is the open-ended exception clause that would allow non-compliance when the lessee can demonstrate that the impacts of exploratory drilling would be minimal or it is determined that there is no feasible or prudent alternative. It does not define what criteria would be used to determine what impacts are "minimal" or whether an alternative is "feasible" or "prudent". There is no requirement that the AO consult with other agencies or affected communities in making those determinations. The need to show that impacts are minimal is presented in the alternative to the need to show that no feasible or prudent alternative exists. The implication is that a lessee need only show that no feasible and prudent alternative exists, even if the impacts would be more than minimal. The provision speaks of "impacts" rather than "risks" of a blowout. While it may be possible to demonstrate that the risks of a blowout are minimal, it is unclear how a lessee could show that the impacts of a blowout from a drilling structure placed in a fish-bearing river, stream, or lake would be minimal. ***(Comment No. 196407-062)***

Response To: Comment 196407-062

The flexibility built in to many of the Stipulations and Required Operating Procedures is not to be construed as an additional exception process but as a mechanism to address resource issues based on project-specific information; see responses to 196264-006, 196407- 011, 015, 037, 038 and 059 under Stipulations and Required Operating Procedures.

Prescriptive based mitigation often attempts to define a requirement with a one size fits all approach that does not allow adjustments when site and project information is available. The stipulations and Required Operating Procedures that have been developed for the Action alternatives are intended to allow BLM through its permitting and authorization process (see Chapter 2) to use project-specific information (that does not now exist) to refine the requirements and define them in the context of the project to better meet the stated objectives. We believe this is a far more effective approach than to try to define these standards using the "one size fits all" approach based on hypothetical situations. Necessary consultation with other agencies and local communities will occur as part of the permitting process.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-19: ROP D-1, Requirement/Standard. This says exploratory drilling is prohibited in fish-bearing lakes, yet Alternatives B and C allow drilling in Teshekpuk Lake. Please clarify. ***(Comment No. 196557-058)***

Response To: Comment 196557-058

Per ROP D-1, exploratory drilling would be allowed in lakes in the Northeast Planning Area (if not otherwise prohibited) if no feasible alternative exist. In the case of exploratory drilling far offshore in Teshekpuk Lake, it is likely no feasible alternative exists.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Similarly, existing Stipulations prohibit exploratory drilling in lake beds and construction of permanent or gravel facilities, including roads, during exploration. These prohibitions are not included under Alternatives B and C, which, despite terrestrial and aquatic buffers, could allow drilling, pipelines, causeways and production pads in some lakes, including Teshekpuk Lake and large goose molting lakes, and which could allow construction of gravel roads and pads for exploration activities. It seems clear that the potential exists for greater impacts under proposed Stipulations and ROPs than under the existing management regime. ***(Comment No. 197619-031)***

Response To: Comment 197619-031

See response to comment 197616-118, 196407-011, and -059 under stipulations and ROPs. Also, under the Proposed Action Teshekpuk Lake has been deferred from leasing.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative B, Section 4.4.4.3, Water Resources, Effectiveness of Stipulations and Required Operating Procedures, Page 4-1 84. In this subsection and in many other locations, it is noted that drilling would not be allowed in fish-bearing lakes (Lease Stipulation D-1). However, under Alternatives B and C, Teshekpuk Lake, which is fishbearing, would be available for drilling in much of the lake (Lease Stipulation K-3). This apparent conflict should be rectified. (see previous comments on K-3 on page 5) ***(Comment No. 197620-087)***

Response To: Comment 197620-087

The sections in which drilling in fish-bearing lakes are discussed have been revised to acknowledge that drilling could occur in Teshekpuk Lake, a fish-bearing lake.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Oil and Gas Exploratory Drilling. Lease stipulation D-1: This stipulation is less protective than Stipulation 28 (1998 ROD), which prohibited exploratory drilling in rivers, streams and fish bearing lakes, unless the activity was environmentally preferable. EPA recommends deleting the "no feasible or prudent alternative" exception clause unless clear and measurable criteria and presented. ***(Comment No. 197632-018)***

Response To: Comment 197632-018

We do not believe Lease Stipulation D-1 is less protective. See 196407-011 under Stipulations and ROPs.

TOPIC: STIPULATIONS AND ROPS

ISSUE: D-2

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-20, D-2: this is another clear example of what is wrong with many of the proposed mitigation measures. It represents a significant weakening of the comparable existing Stipulation 27. The stated objective is to minimize surface impacts from exploratory drilling. A minor point is that it should be stated more broadly to minimize surface impacts from exploratory operations. The requirement/standard is that exploration must be carried out using temporary facilities. The fatal flaw of the measure is the open-ended exception clause that would allow non-compliance not only when an environmentally preferable alternative is identified, but also when permanent facilities are "necessary to carry out exploration more economically". Here, and in all other proposed measures where it appears, any exception based on criteria other than environmental preferability must be eliminated. Clauses appearing throughout the proposed measures that allow noncompliance with an objective based solely on economic considerations are especially galling in that they require only that noncompliance enable a project to be undertaken marginally more economically. The clauses do not require that the project be rendered wholly uneconomic, only that noncompliance would allow it to be undertaken "more" economically. The degree of offensiveness of these clauses notwithstanding, they must all be eliminated from the proposed mitigation measures. **(Comment No. 196407-063)**

Response To: Comment 196407-063

In the DEIS, under Alternatives B and C, we do not believe we were proposing any change in the way exploratory drilling is accomplished. Lease stipulation D-2 would not require or advocate exploration from newly constructed permanent pads; we were only saying that if doing so is more economic it may be allowed. Given the cost of constructing permanent facilities this would rarely, if ever be the case. However, we believed the provision was necessary because a lease gives the lease holder the right to develop their lease and no Stipulation or Required Operating Procedure should be so costly that the ability to develop the lease is denied. Prior to authorizing any such construction additional analysis would be required and appropriate mitigation developed. In the FEIS, D-2 under the Proposed Action Alternative D, has been modified removing from the last sentence "or necessary to carry out exploration more economically." It should also be noted that currently (under the 1998 ROD) while the mechanism for approval would be different such a facility could also be authorized.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The BLM's repeated assertion that Alternatives B and C would have no greater impacts than the status quo is also not borne out by a comparison of the stipulations themselves. Take for instance the proposed change from stipulation 27 in the 1998 NE NPR-A ROD which prohibits the construction of permanent oil and gas facilities during the exploration phase to lease stipulation D-2 in Alternative B and C which allows a lessee to build permanent exploration facilities if that would allow for more economical exploration.118 This is a potentially radical change that would reverse standards that have prevailed on state and federal lands on the North Slope since the 1970s. This practice was abandoned because building permanent facilities to support exploration has more impact than ice road supported construction, hands down, end of story.119 So, how could Alternatives B and C that would allow the construction of permanent facilities during the exploration phase provide a level of protection equal to the 1998 NE NPR-A ROD? It can't. The potential that permanent roads may be used for exploration raises a whole host of other issues. Regardless of the likelihood that permanent facilities would be constructed to support exploration, the fact that the BLM is even considering such a radical change from the way that exploration has been done since the earliest days on the North Slope needs explanation in the Amended Draft EIS. **(Comment No. 197616-118)**

Response To: Comment 197616-118

We do not believe that we were proposing any change in the way exploratory drilling is accomplished. Lease stipulation D-2 as written in Alternatives B and C, did not require or advocate exploration from newly constructed permanent pads; the stipulation stated that if doing so is more economic it may be allowed. Given the cost of constructing permanent facilities this would rarely, if ever be the case. However, we believed the provision to be necessary because a lease gives the lease holder the right to develop their lease and no Stipulation or Required Operating Procedure should be so costly that the ability to develop the lease is denied. Prior to authorizing any such construction additional analysis would be required and appropriate mitigation developed. It should also be noted that currently (under the 1998 ROD) while the mechanism for approval would be different such a facility could also be authorized through the exception process. In the final Proposed Action Alternative D, Lease Stipulation D-2 has been modified removing the words "or necessary to carry out exploration more economically."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Allowing development into the core areas now off-limits at Teshekpuk Lake would dramatically decrease core areas where these kinds of avoidance by definition will not occur. The Draft EIS does not acknowledge these impacts. Nor does it take any account of how avoidance of additional areas as a result of Stipulation D-2, with its permission to develop permanent facilities for exploration (if that is more economical), will impact the sociocultural health of our community. Putting a road into NPR-A, with potential public access into the heart of our remaining traditional range, would have enormous impacts, but one would never have any concept that this was a possibility from the Amended Draft EIS. How about avoidance for 16 miles in any direction from a road stretching far into NPR-A. The calculations are simple enough to do, but apparently the Amended Draft EIS would prefer not to include them because they interfere with the pre-ordained result of imposing these ROPs, opening 487,000 additional acres to leasing and the neat, but fallacious conclusion there's no problem here because the level of protections under the Preferred Alternative is equivalent or greater to that under the present regime.170 How this type of analysis was not made part of the Amended Draft EIS is completely baffling, since we stressed in our scoping letter the significance of hunter avoidance.171 ***(Comment No.* 197616-175)**

Response To: Comment 197616-175

See response to comment 197616-176 under Cumulative Impacts and Analyses

Comment From: Environmental Coalition (Comment Letter No. 197617)

Contrary to the 1998 ROD, the draft IAP/EIS authorizes exploratory drilling (Lease Stipulation D-2) in the rivers, streams and lakes beds without any impact analysis or scientific rationale. The 1998 ROD only authorized an exception if drilling in the river bed was environmentally preferable not simply "if there is no prudent alternative" (draft IAP/EIS at 2-52). This is simply one more example of BLM allowing changes in oil and gas related activities that will contribute to the direct, indirect and cumulative impacts to the resources the agency is mandated to protect. ***(Comment No.* 197617-111)**

Response To: Comment 197617-111

See response to comment 197616-118 under Stipulations and ROPs.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.6.2.2, Page 2-20, D-2 Lease Stipulation: The Requirement Standard for this stipulation would permit construction of permanent facilities such as gravel roads, airstrips, and pads for exploratory drilling programs if such structures would allow exploration to be conducted "more economically," though it does not describe an economic threshold that would guide decisions regarding such permanent structures. Because of the potential impacts of these structures and the increased access they may provide, the Service believes that only temporary facilities should be allowed

during exploration, particularly in biologically sensitive areas including the TLSA and the CRSA. ***(Comment No. 197618-023)***

Response To: Comment 197618-023

See response to comment 197616-118 under Stipulations and ROPs.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease stipulation D-2: This stipulation is les protective than Stipulation 27 (1998 ROD), which prohibited permanent or gravel facilities during exploration. EPA recommends this ROP prohibit permanent or gravel facilities during exploration. An exception clause that depends on project economics should not be included for this stipulation, or for other stipulation and ROPs, unless specific and measurable decision criteria and described and a demonstration that activities would not cause adverse environmental impacts is required. ***(Comment No. 197632-019)***

Response To: Comment 197632-019

See response to comment 197616-118 under Stipulations and ROPs.

TOPIC: STIPULATIONS AND ROPS

ISSUE: DEFINITIONS

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

In addition, in the definition of "permanent oil and gas facilities", material sites are specifically excluded, and therefore not subject to restrictions on the placement of such facilities. This is a problem in several respects. First, many reviewers may not realize that "material sites" means, or at least includes, gravel mines. Where gravel mines are developed is a significant issue for many reviewers, including the Borough, area communities, and residents. They are not less, and perhaps more permanent, than production facilities, pipelines, docks, roads, and the other facilities listed in the definition, and may cause impacts surpassing such facilities in both scope and duration. Any provision dealing with gravel mines must refer to them using that commonly used name. Further, such sites clearly are "permanent" alterations of the North Slope landscape, have been recognized as permanent in the past, must be recognized as permanent facilities under the proposed amendment, and must be made subject to all restrictions on the placement of such facilities. ***(Comment No. 196407-027)***

Response To: Comment 196407-027

See response to comment 196407-066 under topic Stipulations and ROPs.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-21, E-8: the gravel mine site design and reclamation requirements and standards listed are neither true requirements nor standards. They simply present a short 3-item list of things to consider in preparing and reviewing a mine site plan. Two of the items are even presented as alternatives. One suggests locating mine sites outside the active flood plain, while a second deals with the design and construction of sites within active flood plains. Additional considerations must include proximity to critical wildlife concentrations and habitat, prevailing wind patterns and the potential for dusting impacts on water quality, vegetation, and wildlife, and proximity of important subsistence harvest sites and access routes. As we have argued above, gravel mine sites must be considered permanent facilities and be made subject to all prohibitions and conditions applicable to such facilities. ***(Comment No. 196407-066)***

Response To: Comment 196407-066

The Secretary is specifically authorized to make dispositions of mineral materials (which includes sand and gravel) for oil and gas development under 43 CFR 2361.0-7 (b) (2). Such disposition is pursuant to the Act of July 31, 1947 or the Materials Act. Because the disposition of sand and gravel is governed under separate authority that carries with it separate requirements (see 43 CFR Part 3600) Required Operating Procedure E-8 is limited to the stated mining plan requirements. In authorizing mineral material disposal BLM must take into consideration the effects of the operation on other resources and land uses [43 CFR 3600.05 (k)]. We do not consider a gravel mine to be facility, but this does not mean that impacts of such operations are not considered with appropriate mitigation developed. Upon receipt of an application for sale or free use of mineral materials, the AO shall complete an environmental review to ensure that unnecessary or undue degradation is prevented (43 CFR 3601.1-3).

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-12: Definitions, last sentence of Permanent Oil and Gas Facilities. After "Material sites" add ", exploration wellheads," as excluded from the definition. ***(Comment No. 196557-079)***

Response To: Comment 196557-079

We have added "exploration wellheads' to the definition of Permanent Oil and Gas Facilities in Chapter 2.

Comment From: Anadarko (Comment Letter No. 197615)

Definition of Consultation on page 2-24 of IAP/EIS: This definition should be deleted as unnecessary and duplicative of the definition previously included at page 2- 12 of the IAP/EIS. ***(Comment No. 197615-020)***

Response To: Comment 197615-020

We do not believe that this is a redundancy that is not warranted.

TOPIC: STIPULATIONS AND ROPS

ISSUE: E-11

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Stipulations and Routine Operating Procedures: ROP E-11 (p. 2-22) requires aerial breeding pair surveys before approval of facility construction. However, nonbreeders, including molting waterfowl, are also important to assess and monitor. ***(Comment No. 197610-071)***

Response To: Comment 197610-071

We are committed to protect molting waterfowl at all levels. ROP E-11 represent "one" measure to protect

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Under special conditions in yellow-billed loon habitat (pp. 2-22 and 23), the DEIS states: "Development may be prohibited within buffers or activities curtailed while birds are present." [emphasis added] This does not give us any confidence that yellow-billed loons actually will be protected in such situations. How will these conditions be determined, and by whom? Will BLM have sufficient field capacity to assess the need to curtail activities? ***(Comment No. 197610-072)***

Response To: Comment 197610-072

These decisions will be addressed at the time of authorization/permitting. Please see Section 2.6.2.1 for a detailed description of BLM's permitting process. At present, the BLM is confident that we will have sufficient field capacity to conduct the necessary monitoring.

Comment From: Anadarko (Comment Letter No. 197615)

ROP E-11: This ROP requires a lessee to conduct surveys for spectacled and Steller's Eiders and yellow-billed loon for three years prior to any authorization for construction. On page 2-13 of the IAP/EIS, BLM acknowledges that mitigation of resources will "come with some costs to oil and gas operations;" however, lessees should not be required to shoulder the whole burden. Requiring three years of surveys prior to construction will needlessly extend the required planning process and may deprive a lessee of the ability to utilize the full lease term as construction would not be allowed prior to the completion of the requisite surveys. We recommend that BLM shorten the number of years such surveys would be required and provide a definition of what activities would fall within the prohibition on construction. ***(Comment No.* 197615-017)**

Response To: Comment 197615-017

We have considered your comment in developing the final Preferred Alternative but believe a three year study is important and reasonable.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Under special conditions in yellow-billed loon habitat (p. 2-22/23), it states that "Development may be prohibited within buffers or activities curtailed while birds are present." (emphasis added) This does not give us any confidence that yellow-billed loons will actually be protected under this condition. ***(Comment No.* 197617-098)**

Response To: Comment 197617-098

The flexibility built into the stipulations and ROPs is not to be construed as a mechanism to abrogate our responsibility to mitigate or avoid to minimize unnecessary surface damage and to minimize ecological disturbance throughout the Petroleum Reserve. Also see response to comment 196407-062 under Stipulations and ROPs.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.6.2.2, Page 2-22, E-11 ROP: The Requirement/Standard states that breeding pair surveys be conducted prior to approval of facility construction. Surveys, however, should not be constrained to breeding pairs only. Non-breeding birds may constitute a large portion of the population in years of poor breeding conditions; therefore, permitting of facilities should consider potential impacts to breeding and non-breeding birds. Additionally, the Requirements/Standards for this ROP emphasize only listed species and Yellow-billed Loons. It does not mention Birds of Conservation Concern species or any precautions to be taken to keep these species from becoming threatened or endangered. ***(Comment No.* 197618-024)**

Response To: Comment 197618-024

We have made the changes to ROP E-11 to include non-breeding birds and Birds of Conservation Concern per your request.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.6.2.2, Page 2-22, E-1 1 ROP, Special Conditions in Spectacled and/or Steller's Eiders Habitats, c.: This Special Condition addresses potential impacts of overhead power lines. The phrase "to the extent practical" should be

changed to "to the extent practicable," and the criteria previously agreed to by the Service and the BLM to determine the few circumstances in which exemptions may be appropriate should be included as part of this condition. Specifically, power or communication lines could be routed overhead only when: 1) they are located entirely within the boundaries of a facility pad; 2) engineering constraints at the specific location make it unfeasible to bury or connect them to vertical support members; or, 3) human safety would be compromised. Additionally, we believe this condition should be implemented throughout the entire Northeast Planning Area (or in the entire NPR-A), not just where listed eiders are recorded on breeding surveys. The goal of the Endangered Species Act is to facilitate recovery of listed species, rather than merely maintain current populations. To apply conservation measures exclusively in areas occupied during the 3 most recent years prevents proactive protection of habitat that may become important in future years. ***(Comment No.* 197618-025)**

Response To: Comment 197618-025

We have made the additions to ROP E-11 per your request.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.6.2.2, Page 2-22, E-11 ROP, Special Conditions in Yellow-billed Loon Habitats, b.: This Special Condition proposes to minimize disturbance around yellow-billed loon nests and nest lakes, and it lists buffers for each that are considered "accepted mitigation," however, it is unclear whether development would be permitted within buffers (Development may be prohibited within buffers or activities curtailed while birds are present", our italics). This Special Condition should be reworded to indicate clearly that development will be prohibited within the buffers and that development-related activities will be minimized while birds are present. ***(Comment No.* 197618-027)**

Response To: Comment 197618-027

Development will be prohibited if it is necessary to meet the stated objective. Also see 196407-059 under Stipulations and ROPs.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Additionally, the Service recognizes BLM's intent to protect yellow-billed loons by proposing Special Conditions associated with their habitats; however, we believe the language in Special Condition (b) should be strengthened to clearly prohibit development within defined buffers. ***(Comment No.* 197619-024)**

Response To: Comment 197619-024

If such a restriction is necessary it is allowed under ROP E-11(b) special conditions in yellow-billed loon habitats.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

ROP E-11: Unless this ROP was developed in consultation with regulatory agencies with authorities over endangered species, EPA recommends that this ROP and all proposed requirements for protection of endangered species be included as lease stipulations. The requirements should be developed in consultation with appropriate resource and regulatory agencies. ***(Comment No.* 197632-023)**

Response To: Comment 197632-023

This ROP was developed in consultation with the US Fish and Wildlife Service. The BLM believes this requirement is more appropriate left as ROPs; See response to Comment No. 197632-006, Stipulations and Required Operating Procedures.

TOPIC: STIPULATIONS AND ROPS

ISSUE: E-12

Comment From: Michael R. North (Comment Letter No. 196264)

Page 2-23, Stipulation E-12. Since eider surveys are required before authorization of construction (see p. 2-22), why not REQUIRE ground-based wildlife surveys at the same time rather than level it to the discretion of the AO? ***(Comment No. 196264-010)***

Response To: Comment 196264-010

Eider surveys under ROP E-11 are required because the Spectacled and Steller's Eiders are listed under the Endangered Species Act. A wildlife survey of non listed species may not be warranted, this decision will depend on many variables including the proposed development, the potentially impacted species and anticipated issues.

Comment From: Anadarko (Comment Letter No. 197615)

ROP E- 12: The ROP requires the development of an ecological land classification map prior to the approval of facility construction. This ROP needs to be clarified to specify who will be responsible for the creation of such a map. We respectfully suggest that such a requirement should rest with BLM rather than a lessee. Although we agree that such a map may be a useful tool, mandating its development prior to any and all facility construction is unnecessarily broad. ***(Comment No. 197615-018)***

Response To: Comment 197615-018

We believe that an ecological land classification map is necessary, and is the industry's responsibility not BLM's, to provide prior to the approval of the construction of a facility. It is currently a requirement in the Northwest Planning Area and will be proposed as a requirement of industry in the Northeast Planning Area.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.6.2.2, Page 2-23, E-12 ROP: The ecological mapping tool does not include animal presence and abundance as part of the modeling effort. Ecological land classification maps should be updated and based on animal-habitat relationship models. Given the inter-year variability present on the North Slope, ground surveys for one year are unlikely to yield sufficient data for determining locations of permanent facilities. At a minimum, ecological land classification maps should be updated at 5-year intervals to allow meaningful analyses of facility development proposals within the Northeast Planning Area. Habitat is expected to change over time; permitting of facility development should be based on the most current habitat data available. ***(Comment No. 197618-028)***

Response To: Comment 197618-028

We agree that permitting should be based on the most current data available, that is why, if adequate information is not available, we are requiring a ground-based wildlife survey prior to approval of exact facility location and facility construction.

TOPIC: STIPULATIONS AND ROPS

ISSUE: E-2

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-20, E-2: this is an example of another kind of flaw in the proposed measures. The stipulation aims to protect fish-bearing water bodies, water quality, and aquatic habitats by establishing buffer zones of 500 feet and 100 feet from fish-bearing and non-fish-bearing water bodies, respectively. A built-in exception clause would allow the placement of permanent facilities within these zones, however, if the lessee can demonstrate that impacts "are minimal". No criteria are identified that would be used to define what constitutes "minimal" or more than minimal impacts. Moreover, this approach seems to undermine one primary reason for establishing buffers of this kind. Buffers should be used to protect key resources, habitat, and uses not only from known and anticipated agents (e.g., noise), but also from potential unanticipated events like a well blow-out or other hazardous discharge. Use of the clause "are minimal" implies that the required demonstration by the lessee need only address planned operations, and not potential unanticipated events. There is no way in which a lessee could demonstrate that the oil spill impacts associated with a proposed facility "are" minimal to any degree of certainty that would obviate the need for a buffer. It is true that with proper facility design and oversight of operations the risk of a major discharge can be characterized as minimal. It must also be acknowledged, however, that even where the risk of a discharge is minimal, the resulting impacts under certain circumstances can be substantial. Minimal absolute buffer zones must be maintained around fish-bearing and non-fish-bearing water bodies. ***(Comment No.* 196407-064)**

Response To: Comment 196407-064

See response to comment 196407-062 under topic Stipulations and ROPs.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease stipulation E-2: This stipulation should describe how a lessee would demonstrate" minimal impacts" to water bodies, water quality and aquatic and riparian habitat. EPA recommends the case-by-case approval clause in this stipulation be deleted, unless measurable decision criteria are included. ***(Comment No.* 197632-021)**

Response To: Comment 197632-021

See response to comment 196407-011 under Stipulations and ROPs.

TOPIC: STIPULATIONS AND ROPS

ISSUE: E-3

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease stipulation E-3: EPA recommends changing the monitoring program requirements from "many" to "shall." ***(Comment No.* 197632-022)**

Response To: Comment 197632-022

If based on site and project specific information it is determined during the authorization process that a monitoring program is necessary to meet the stated objective, it will be required as a condition of the authorization.

TOPIC: STIPULATIONS AND ROPS

ISSUE: E-7

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-21: ROP E-7c. This states that "A minimum distance of 500 feet between pipelines and roads should be maintained when feasible." The 1994 report by the Alaska Caribou Steering Committee reviewed previous caribou

research and came up with a recommended range of separation distance between a road and pipeline, to facilitate caribou passage. In this report, 350 feet was identified as the minimum distance, with 1000 feet as the maximum separation distance. To be consistent with these recommendations, CPAI requests that the minimum distance be changed to 350 feet. ***(Comment No. 196557-061)***

Response To: Comment 196557-061

We have considered your comment and continue to believe that a minimum distance of 500 feet between pipelines and roads is an appropriate distance based on the report from the Alaska Caribou Steering Committee.

TOPIC: STIPULATIONS AND ROPS

ISSUE: E-8

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-20, E-3: the measure concludes with the statement that a monitoring program "may" be required to address the objectives of water quality and free fish passage. A monitoring program associated with the placement of any causeway, dock, artificial island, or bottom-founded structure must be required. With the exception perhaps of a small dock, these are substantial facilities that have the potential to cause significant impacts to fish passage, subsistence use, and access to subsistence use areas. In addition, the requirement for any such monitoring program must be accompanied by the authority to require the cessation or modification of operations if significant impacts are identified. ***(Comment No. 196407-065)***

Response To: Comment 196407-065

The AO shall take such action, including monitoring, as deemed necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the Reserve consistent with the requirements of the NPRPA [43 CFR 2361.1 (a)]. Thus, by regulation, a monitoring program will be required if necessary to meet the stated objective. If the proposed mitigation is ineffective, BLM has the regulatory authority to protect surface resources and prevent environmental degradation and to prepare rules and regulations necessary to carry out surface management and protection duties in the Petroleum Reserve (43 CFR 2361.0-4)

TOPIC: STIPULATIONS AND ROPS

ISSUE: E-9

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-21 – 2-22, E-9: lessees should be required not only to utilize best available technology to prevent facilities from providing nesting, denning, or shelter sites for ravens, raptors, and foxes, but should also be required to implement strict procedures governing all activities during construction and operation of facilities to prevent feeding, whether intentional or inadvertent, of these predators. ***(Comment No. 196407-067)***

Response To: Comment 196407-067

Required Operating Procedure I-1 requires the lessee to address the importance of not disturbing wildlife (this would include feeding).

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-22: ROP E-9. This requires that the lessee provide the AO with an annual report on predators' use of oil and

(Comment No. **196557-062)**

Response To: Comment 196557-062

We believe that advising BLM of sightings as they occur would be very useful. Our intention of an annual report is one of practicality and as a way of evaluating the "overall" effectiveness of our attempt to prevent nesting, denning, or shelter sites for various predators. However, we would appreciate ongoing siting information in addition to an annual

TOPIC: STIPULATIONS AND ROPS

ISSUE: EXCEPTION PROCESS

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Where the lines will be drawn in striking an appropriate balance is the central issue of this planning process. The document does not provide sufficient assurances to the directly affected North Slope community that the trade-offs BLM might be willing to make somewhere down the line are trade-offs we can live with. The agency has not fully explained why, as is stated beginning on the last line of page 2-13, "there will remain a need to consider exceptions and modifications on a case-by-case basis" in the context of a performance-based system. Moreover, the guidelines offered on page 2-14 for use in considering exceptions appear to be a significant weakening of those identified in the 1998 Plan in that each of them may not be linked to a required finding that "the alternative means proposed by the lessee fully satisfies the objective(s) of the stipulation." As it appears on page 2-14, it seems that the requirement that the alternative proposed by the lessee/permittee fully satisfies the objective(s) of the lease stipulation or ROP is only linked to the third bulleted guideline, when in the 1998 Plan, it was linked to each of the comparable guidelines. This may be a simple error in editing, with the clause following "and" meant to appear as a fourth bullet, but it must be clarified. As written, the exception guidelines are an open door for lessees/permittees seeking to avoid compliance with particular stipulations or ROPs. An applicant apparently need only show that compliance would be technically not feasible or too expensive. The consultation requirement provides us little comfort since, as discussed above, the AO need only "inform" the Borough of potential actions. ***(Comment No.* 196407-036)**

Response To: Comment 196407-036

See response to comment 196407-037 under topic Stipulations and ROPs.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Editing questions notwithstanding, we believe that given a shift to a performance-based system and the mandates described above, all exception clauses must be eliminated from the proposed mitigation measures or significantly narrowed to allow only for circumstances in which an environmentally preferable alternative to compliance is identified. The exception clauses contained in many of the proposed performance based measures are unacceptable. Key terms are undefined, and no criteria are given that would govern the granting of exceptions. The result is that the Borough and other reviewers have no real sense of how much protection is embodied in the proposed mitigation measures, and what impacts to the environment, wildlife resources, and subsistence are possible or even likely. ***(Comment No.* 196407-037)**

Response To: Comment 196407-037

The exception process has been modified to require that any exception granted must still satisfy the objective(s) of the stipulation or Required Operating Procedure. Also, we do not believe that the proposed Stipulations and Required Operating Procedures have built in exception clauses but rather many of the Stipulations and Required Operating Procedures have a degree of flexibility built in to allow us to adapt the standards and requirements to meet the objectives based on project-specific information.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

In particular, we strongly believe that the economics of a project should never be permitted to dictate whether or to what degree a protective measure is applied. It is not clear whether or to what extent some overarching exception clause utilizing the guidelines indicated on page 2-14 would apply where a specific stipulation or ROP already contains its own exception clause or where a specific stipulation or ROP contains no exception clause. It is unclear whether a prescriptive component of a proposed stipulation or ROP, like the 7-foot pipeline elevation requirement of ROP E-7 for instance, is subject to exception. Knowing the full extent to which any or all of the protective provisions of the proposed stipulations and ROPs are subject to exception is critical for two reasons. First, North Slope governments, organizations, and residents who will be most directly affected by implementation of this Plan must know what we are commenting on or agreeing to. Second, the Draft argues that mitigation measures would reduce impacts of certain facilities or operations, but does not adequately analyze the effects of those facilities or operations if exception clauses are applied to reduce the scope or effectiveness of the mitigation measures. ***(Comment No.* 196407-038)**

Response To: Comment 196407-038

If a Stipulation or Required Operating Procedure requirement can be shown to be so costly that development is uneconomic, the exception process allows us to look for other measures to meet the objective of the Stipulation or Required Operating Procedure. This does not mean that protection of impacted resources is therefore set aside, only that we will explore other means to meet the objective. All Stipulations and Required Operating Procedures are subject to the exception process unless it is stated no exceptions will be granted. In this case a plan amendment is required. Specifically regarding the 7 foot pipeline elevation requirement – yes it would be possible to grant an exception to this requirement (if the objective can be met). We do not believe that granting an exception will ever become commonplace, however, we do believe a lease gives the leaseholder the right to develop their lease. Also see responses 196407-015 and 196407-037 under Stipulations and Required operating Procedures.

Comment From: Anadarko (Comment Letter No. 197615)

Section 2.6.2.1- Stipulation(s) and the Required Operating Procedure(s) Exception Process: This section should be revised to be aligned with BLM's existing regulations regarding exceptions to stipulations found at 43 C.F.R. 3 101.1-4 as the procedures set forth here are unduly restrictive. In addition, it states that "a lessee/permittee shall notify the A0 in a timely manner that an exception is going to be requested." Assuming this provision was included to allow BLM ample time to meet any consultation requirements it may have prior to a revision of a stipulation, BLM should be more specific regarding the applicable time frame to provide lessees sufficient notice. We recommend BLM delete the quoted language or modify it to provide a more definitive time frame. ***(Comment No.* 197615-013)**

Response To: Comment 197615-013

We believe that our proposed exception process is in compliance with 43 C.F.R. 3101.1-4. Regarding your request for a definitive timeframe - one of our most important and reliable mechanisms for conveying information regarding oil and gas activities on the North Slope to local residents is the Subsistence Advisory Panel (SAP). Given the SAP meeting schedule, generally quarterly, we need the information regarding a request for exception in time to present the information to the SAP, and the timing must be such that the SAP and local residents have the necessary time to comment on the proposed exception. Therefore, what is timely, depends on 1) the SAP meeting schedule, 2) the nature of the request for exception, and 3) when the applicant wants to begin on-the-ground activities.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

In the event that an exception to a lease or permit stipulation is requested, and before an exception may be granted, the Authorized Officer (AO) shall find that implementation of the stipulation is:
(1) a) technically not feasible, or
b) economically prohibitive, or
c) an environmentally preferable alternative is available, and
(2) the alternative means proposed by the lessee fully satisfies the objective(s) of the stipulation. ***(Comment No.* 197616-**

090)

Response To: Comment 197616-090

See response to comment 196407-037 and 040 under topic Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The "and" is underlined in this quote because during the meetings between Nuiqsut's representatives and the BLM on December 4th and 5th of 2003, some BLM representatives suggested that under the 1998 ROD an exception can be granted if implementation of a stipulation is not technically feasible or is cost prohibitive.83 The placement of the "and" between numbers 1 and 2 of the 1998 exceptions clause is not an accident. It means that the conditions in subparagraphs (1) and (2) of the 1998 exceptions clause must be met before an exception can be granted. In other words, the 1998 ROD requires that the objectives of a stipulation are always met by a lessee. ***(Comment No.* 197616-091)**

Response To: Comment 197616-091

See response to comment 196407-037 and 040 under topic Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Now, compare the 1998 NE NPR-A ROD with the exceptions clause proposed for Alternatives B and C which reads: In the event that an exception to a stipulation or ROP is requested, and before an exception may be granted, the lessee/permittee shall demonstrate to the satisfaction of the AO that implementation of the stipulation or ROP: is technically not feasible; or is economically prohibitive, or has an environmentally preferable alternative and the alternative proposed by the lessee/permittee fully satisfies the objective(s) of the lease stipulation or ROP. ***(Comment No.* 197616-092)**

Response To: Comment 197616-092

See response to comment 196407-037 and 040 under topic Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The difference between the two exception clauses may seem subtle, but it has enormous significance. By changing the exceptions clause so that the objective of a lease stipulation or ROP must only be met when the lessee or permittee is proposing an environmentally preferable alternative, lessees and permittees are no longer required to satisfy the objective of a stipulation or ROP when an exception is needed because meeting the requirements of a stipulation or ROP is technically not feasible or is economically prohibitive. As stated in the 1998 NE NPR-A ROD, "[e]xceptions to stipulations may be granted under strict conditions." But strict conditions no longer must be met in order to get an exception under Alternatives B and C. ***(Comment No.* 197616-093)**

Response To: Comment 197616-093

See response to comment 196407-037 and 040 under topic Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

While we are being told that the cornerstone of the performance-based ROPs and stipulations proposed in Alternatives B and C is the requirement that industry meet objectives,89 we are actually seeing that through application of the exceptions clause, the objectives can be avoided altogether. Protections to surface resources and to subsistence uses in the NPR-A will suffer when exceptions are granted to mitigation measures without meeting the objective of the mitigation measure. This potentially enormous difference in management styles is not even noted in the Amended

Draft EIS. ***(Comment No. 197616-097)***

Response To: Comment 197616-097

See response to comment 196407-037 and 040 under topic Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Not only is there no analysis of its potential impact, but at least once the Amended Draft EIS incorrectly states that the same exception clause applies to all alternatives discussed.90 Had the Amended Draft EIS considered the differences in the exceptions clauses, there is simply no way that it could have rationally concluded that Alternatives B and C provide the same level of protection as the 1998 NE NPR-A ROD. On this fundamental point the Amended Draft EIS has not taken the required hard look at the effectiveness of the mitigation packages proposed in Alternatives B and C, nor has the Amended Draft EIS reasonably compared the effectiveness of Alternative B or C with the 1998 NE NPR-A ROD. ***(Comment No. 197616-098)***

Response To: Comment 197616-098

See response to comment 197618-005 under Stipulations and ROPs

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS fails to provide any analysis or reasoning behind and predicted effectiveness of the new mitigation measures. At the end of each section of the effects analysis, the draft IAP/EIS merely lists the mitigation measures potentially relevant to the resource analyzed. Nowhere in the document is there an analysis of the mitigation measures effects rather simply unsupported conclusions that the measures will achieve the stated goals. A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA. ***(Comment No. 197617-168)***

Response To: Comment 197617-168

The stipulations and required operating procedures are an integral part of each of the action alternatives. As such the analysis of each alternative is addressing the effectiveness of proposed mitigation; also see responses to comments 196407-011 and 197617-009 under Stipulations and ROPs.

Comment From: Charles Brower (Comment Letter No. 197980)

All exception clauses must be eliminated or significantly narrowed. The exception clauses contained in many of the proposed performance based measures are unacceptable. The economics of a project should never be permitted to dictate whether or to what degree a protective measure is applied. The Draft argues that mitigation measures would reduce impacts of certain facilities or operations, but does not adequately analyze the effects of those facilities or operations if exception clauses are allowed to reduce the effectiveness of the mitigation measures. ***(Comment No. 197980-020)***

Response To: Comment 197980-020

See response to comment 196407-037 under Stipulations and ROPs - Exception Process

Comment From: Geoff Carroll (Comment Letter No. 197980)

Another weakness in the Plan is the use of exception clauses in the stipulations. Exception clauses allow the economics of a project to dictate to what degree protective measures are applied. This was brought to light in the Alpine Satellite Development Project where BLM will apparently use an exception clause to allow a drill pad in the Fish Creek Subsistence Setback for economic reasons. As you saw on one of the maps, the Fish Creek Subsistence

area was designated as a place where no surface structures were supposed to be allowed. This giant loop-hole takes away much of the protection that stipulations have to offer. A setback should be a setback. It shouldn't just be a setback until oil is found. **(Comment No. 197980-043)**

Response To: Comment 197980-043

See response to comment 196407-037 under Stipulations and ROPs - Exception Process

TOPIC: STIPULATIONS AND ROPS

ISSUE: F-1

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-23, F-1: the requirement/standard only applies to "permitted" activities. Why the distinction is made between such activities and other activities is unclear and seems irrelevant in addressing the potential effects of low-flying aircraft on wildlife, subsistence activities, and the peace of our communities. To the extent that BLM has jurisdiction over activities occurring within the NPR-A, this ROP should apply to all flights within the planning area. We expect that the operation of aircraft used to transport personnel, supplies, and equipment to industrial sites would be governed by some permit, and that therefore they would be subject to the ROP as written. It is unclear, however, whether aircraft operations used for pre-construction research, post-construction monitoring, or VIP and other industrial facility tours would be deemed to be used for "permitted" activities. Further, it is unclear whether the term "permitted activities" refers only to operations permitted by BLM, or applies also to activities permitted by any regulatory agency. Many of our residents will tell you from personal experience that any aircraft, whether used for permitted activities or not, is capable of disrupting wildlife and subsistence activities. All flights occurring within the planning area should be subject to appropriate operating restrictions. In addition, with respect to assessing the potential for aircraft disturbance of molting geese, the Draft focuses primarily on the effects of low altitude flights. Greater attention and analysis is warranted concerning the potential for frequency of flights to be a significant factor in determining the level of disturbance. **(Comment No. 196407-068)**

Response To: Comment 196407-068

BLM does not regulate aircraft except if the use of such aircraft is part of an authorization issued by BLM. We do not regulate commercial flights over the area, casual (recreational) use of aircraft or overflights authorized by another agency. We can not regulate something unless we have the authority to do so. Stipulations K-5 and Required Operating Procedure F-1 all address flight frequency.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-23: ROP F-1b. Restrictions on flights post-October 1 would affect the ability to conduct wildlife monitoring studies such as the grizzly bear program, the polar bear program, or caribou monitoring during the rut in mid-to-late October. There should be some clarification about the ability to continue these scientific monitoring studies. CPAI believes that the long-term monitoring results from these and other scientific studies will be helpful to the BLM and other resource agencies during future permit efforts. **(Comment No. 196557-063)**

Response To: Comment 196557-063

F-1b was not intended to restrict flights necessary to survey wildlife to gain information necessary to meet the stated objective of the stipulation. However, flights necessary to gain this information would be restricted to the minimum necessary. We do not intend to prevent scientific monitoring and a clarification has been added to ROPs F-1 and K-4.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-23: ROP F-1e. A flight restriction of 2000 feet above ground level over the Teshekpuk Lake Habitat area between May 20 and August 20 would prohibit the monitoring of caribou and other wildlife by scientific researchers. Under the Monitoring section 2.7 BLM references stipulations and ROPs concerning the conduct of various wildlife, cultural and paleontological surveys prior to development. Many of these studies must be done at altitudes much less than 2000 feet above ground level (between 150 and 200 feet for loon surveys, 100 to 150 feet for eider surveys, and between 300 feet and 500 feet for caribou surveys). We agree that air traffic in these sensitive areas should be minimized, however as currently written, this ROP will prohibit the conduct of wildlife monitoring studies required by BLM. This contradiction in requirements should be clarified in the FEIS. **(Comment No. 196557-064)**

Response To: Comment 196557-064

ROP F-1e was not intended to restrict flights necessary to survey wildlife to gain information necessary to meet the stated objective of the stipulation. However, flights necessary to gain this information would be restricted to the minimum necessary.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

For example, on pp. 2-23/24, the DEIS states [in ROP F-1(e)]: "Aircraft use (including fixed-wing and helicopter) by oil and gas lessees in the Goose Molting Area should be minimized from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices." This new language has much less conservation force than the 1998 stipulation, which suspended helicopter overflights in the Goose Molting LUEA between June 15-August 20. This is a major difference. Recognizing that aircraft overflights can have significant impacts on molting geese (Derksen et al. 1992), this change in stipulation may result in substantial impacts to goose populations in this important molting area. **(Comment No. 197610-066)**

Response To: Comment 197610-066

The new requirement extends the period of concern but recognizes that a total suspension of flights is probably unreasonable/unnecessary. Nevertheless, if the level of flight reduction proves inadequate BLM has the authority to further reduce or suspend flights if necessary. The new requirement also clarifies that BLM can not implement procedures that endanger human life or violate safe flying practices. Also see 196407-011and 065 under Stipulations and ROPs.

Comment From: Environmental Coalition (Comment Letter No. 197617)

For example, on p. 2-24 of the draft IAP/EIS, it states in ROP F-1e that "Aircraft use (including fixed-wing and helicopter) by oil and gas lessees in the Goose Molting Area should be minimized from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices." This new language has much less conservation force than the 1998 ROD stipulation which suspended helicopter overflights in the Goose Molting LUEA between June 15-August 20. This is a significant difference. Recognizing that aircraft overflights can have significant impacts on molting geese (Derksen et al. 1992), this change in stipulation may result in substantial impacts to goose populations using this important molting area. **(Comment No. 197617-093)**

Response To: Comment 197617-093

Lease Stipulation K-4.d provides specific language to limit or eliminate fixed wing and helicopter flights to minimize effects on molting geese.

Comment From: State of Alaska (Comment Letter No. 197620)

Use of Aircraft for Permitted Activities ROP F-1 .c., Page 2-23. This standard recommends designing larger storage

pads and airstrips to accommodate larger aircraft to reduce the number of flights to a facility. However, K-5.e.4 states use of aircraft larger than a Twin Otter during May 20 to August 20 within the Teshekpuk Lake Caribou Habitat Area shall be for emergency purposes only. Limiting the size of the aircraft under K-5.e.4 to a relatively small aircraft with limited cargo-carrying ability, could serve to increase the required number of flights to a facility, thereby conflicting with the intent of ROP F-1 .c to reduce the number of flights to a facility. ***(Comment No. 197620-023)***

Response To: Comment 197620-023

The period between May 20 and August 20 is a critical period for caribou and we feel it is important to restrict aircraft size (K-5-e 4) as well as flight frequency (F-1 c) within the Teshekpuk Lake Caribou Habitat Area during that period.

Comment From: State of Alaska (Comment Letter No. 197620)

ROP F-i.e.., Page 2-23. This ROP states aircraft use (fixed wing and helicopter) by oil and gas lessees in the Goose Molting Area should be minimized from May 20 through August 20. We request the addition of altitude minimums, except for take off and landing, over the GMA in order to meet the intended objective of minimizing the effects of low flying aircraft on geese. ***(Comment No. 197620-024)***

Response To: Comment 197620-024

ROP F-1 e applies to the Goose molting Area and that has been clarified in the Final Proposed Action.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Use of Aircraft for Permitted Activities. ROP F-1: EPA recommends that requirements for aircraft use include measurable decision criteria instead of the vague standards used throughout this ROP. This ROP should be developed in consultation with resource and regulatory agencies, local residents and subsistence users. Monitoring and enforcements of this ROP should be described. Enforceable requirements for aircraft use not associated with a specific permit or authorization should also be included, or this ROP should be changed to a lese stipulation. ***(Comment No. 197632-024)***

Response To: Comment 197632-024

Under ROP F – 1, the standards set in parts a, b and e are very specific with altitude restrictions being given in feet above ground level and specific dates when these restrictions apply. Parts c and d are less specific. Part c intentionally does not set the number of takeoffs and landings to allow us the flexibility to set reasonable restrictions based on project specific information. Part d is simply a guideline that will be addressed by the lessee/permittee during consultation with affected communities as required under ROP H – 1; specifically see part (c) 1 requires a subsistence plan which includes the use of aircraft. BLM believes appropriate agencies were consulted in developing the standards/requirements listed in ROP F – 1:

a. This flight restriction was developed in consultation with USFWS (letter dated May 26, 1995) following delisting of arctic peregrine falcon on October 5, 1994. In February, 1999, at a BLM sponsored workshop a panel of raptor experts thought the requirement to be adequate. Workshop panelists came from ADFG, USFWS, USGS, North Slope Borough, university, and industry biologists. Dates were expanded somewhat as a result of that workshop.

b. This flight restriction was developed following the 1983 leasing EIS. There exists at least one study (Calef, G., E. DeBock, and G. Lortie. 1976. The reaction of barren-ground caribou to aircraft. Arctic 29:201-212) describing the strong escape responses of caribou to aircraft flying below 1000 feet. The dates when these restrictions are put in place were set at October 1 – May 15 in the 1998 NE ROD. However, in the NW National Petroleum Reserve-Alaska ROD, we changed the dates for this restriction to Dec. 1 – May 1. This change was based on satellite collar data collected 1990-1999 and analyzed and reported in 2001, better define the "winter season" for caribou. Finally, BLM has no regulatory authority over flight activities that are not part of BLM permitted activities. We do not believe this ROP should be changed to a lease stipulation; See response to Comment No. 197632-006, Stipulations and Required Operating Procedures.

TOPIC: STIPULATIONS AND ROPS

ISSUE: G-1

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-24, G-1: the last sentence of the Requirement/Standard should be modified to include the requirement that the AO consult with other federal, state, and local agencies in determining whether it is in the best interest of the public to retain some or all facilities upon abandonment or expiration of a lease. ***(Comment No. 196407-069)***

Response To: Comment 196407-069

Any decision to retain an existing facility would be a negotiated process involving an impact analysis and appropriate

Comment From: Anadarko (Comment Letter No. 197615)

G-1 Lease Stipulation: We fully support a requirement to rehabilitate the lands upon the conclusion of oil and gas development activities, and BLM's ability to waive such a requirement in certain circumstances. However, we do not support BLM's ability to require that some or all of the facilities be left in place, especially without adequate compensation to the lessee for those facilities along with an appropriate release of liability. Therefore, we recommend that if this provision is retained in the ROD, it be modified to delete the following sentence: "The A0 may determine that it is in the best interest of the public to retain some or all facilities." In the alternative, if the sentence is retained, we recommend BLM revise it as follows: "The A0 may determine that it is in the best interest of the public to retain some or all of the facilities; however, such a requirement will be subject to BLM and the lessee reaching an agreement regarding compensation and liability." ***(Comment No. 197615-019)***

Response To: Comment 197615-019

The BLM considered your comments during the development of the Final IAP/EIS.

TOPIC: STIPULATIONS AND ROPS

ISSUE: H-1

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-24, H-1 and H-2: the positive aspects of the subsistence consultation provisions are dramatically undercut by the earlier definition of "consultation" that would allow a lessee/permittee to merely "inform" other agencies and entities of potential actions. For the reasons discussed above, that component of the definition must be eliminated. ***(Comment No. 196407-070)***

Response To: Comment 196407-070

See response to comment 196407-062 under topic Stipulations and ROPs.

Comment From: Anadarko (Comment Letter No. 197615)

ROP H-1: Under this ROP, lessees are required to consult directly with affected communities in an effort to "provide opportunities for participating in planning and decision making to prevent unreasonable conflicts between subsistence uses and oil and gas and related activities." Anadarko fully supports consultation with the affected communities and is committed to a close, co-operative relationship with the potentially affected Native organizations and people. However, we also strongly believe that BLM has a strategic role to play in such consultation. Therefore,

we recommend that BLM revise this ROP to provide for BLM's active participation in and facilitation of any consultation thereby achieving consistency and a better understanding of all of the stakeholders issues and concerns. If the provision is retained without the above-recommended revisions, it should nevertheless be revised as follows: Subparagraph (b) should be revised to delete any requirement to provide documentation of consultation as part of a plan of operations. Such a requirement is unnecessary and unduly restrictive. In addition, the last sentence of this paragraph should be deleted. Any analysis of the potential effects of a proposed plan of operations will be included in the applicable environmental analysis of the project prepared by BLM. Mandating such a requirement for a plan of operations unduly shifts BLM's burden to conduct this analysis onto the lessee. ***(Comment No.* 197615-021)**

Response To: Comment 197615-021

BLM believes it is important for industry to consult directly with affected communities as part of the application process so that affected communities have first hand information concerning the proposed activity/development and potential conflicts with subsistence activities are clearly understood and addressed. We do not understand why documenting that this consultation has taken place would be "unduly restrictive". Finally requesting an applicant to supply BLM with an estimate of the potential effects as part of the use authorization process is common and in fact is a question to be answered on standard form 299: "Application for Transportation and Utility Systems and Facilities on Federal Lands". This information does not take the place of our NEPA analysis but among other things is useful as it makes the applicant consider possible impacts early in the process when mitigation such as operation/design modifications can most easily be built into the proposal.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

What besides wishful thinking has brought the BLM to the conclusion that consultation will mitigate the avoidance of oil and gas facilities by subsistence users and the increased impacts caused by opening all of these additional areas to industrialization?183 There is no reason to believe that consultation will be as effective a mitigation measure as the BLM says. The effectiveness of a consultation requirement is pretty dubious since the BLM has acknowledged that amending the 1998 NE NPR-A will create an insurmountable rift between it and the people of the North Slope.184 We've seen a certain amount of consultation with us and the community of Nuiqsut as part of this amendment process, but since the BLM has basically ignored pretty well everything that we've said and gone on and done what it wants to regardless of our protests, it's pretty clear that all the consultation in the world doesn't provide for practical protections or effect. All that "consultation" means is that we'll be better informed about what BLM plans to do to us or allow others to do to us. This process seems more politically motivated and pro-industry than it seems an even-handed, open-minded administrative process. We certainly are not convinced that consultation gives us anything in substantive terms. The real concerns of the local people affected by the BLM's decisions continue to go unheard. ***(Comment No.* 197616-187)**

Response To: Comment 197616-187

Consultation is but one of many measures incorporated into all alternatives to mitigate impacts to subsistence users, see Chapter 2 for descriptions of the alternatives and corresponding stipulations and required operating procedures.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Maybe it is easy to reach this conclusion because there is basically no analysis of the impacts supposedly being mitigated. It only makes sense though that the impacts need to be understood before the effectiveness of mitigation measures can be evaluated. In fact, we pointed out in our NE NPR-A scoping letter how the consultation requirement in the 1998 NE NPR-A ROD has already suffered significant failures and urged that the consultation requirements be strengthened. NE NPR-A Scoping Letter p. 37. See also Kuukpik and KSOP's April 2, 2003 letter Commenting on the NW NPR-A Draft EIS, pp. 17 - 20. ***(Comment No.* 197616-189)**

Response To: Comment 197616-189

The consultation requirements contained in ROP H-1 and H-2 were substantially revised from the consultation

requirements from the consultation process in the 1998 ROD based on our experience since that time and with the intent of strengthening the consultation process.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Under subsistence consultation, it is very important that consultation include Native communities in western and southwestern Alaska not just the those on the North Slope. Subsistence hunters on the Yukon-Kuskokwim Delta have a major interest in waterfowl and molting geese that use the TLSPA. **(Comment No. 197617-099)**

Response To: Comment 197617-099

BLM recognizes the interest of residents in southwestern Alaska concerning possible impacts of the plan amendment

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.6.2.2, Page 2-24, H-l ROP: A large proportion of the brant that breed on the Yukon- Kuskokwim Delta (YKD) congregate in the TLSA to molt (Mallek 2004). Therefore, in requiring the lessee/permittee to consult with affected subsistence communities, the EIS should specify that such communities are not limited to the NSB, rather, subsistence hunters on the YKD and elsewhere in northwest, western and southwest Alaska also have a large stake in the potential impacts to molting geese on the North Slope and in the TLSA in particular. **(Comment No. 197618-030)**

Response To: Comment 197618-030

See response to comment 197617-099 under Stipulations and ROPs - H-1.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Subsistence Consolation for Permitted Activities. ROP H-1: EPA recommends that consultation requirements be lease stipulations, and also included as ROPs that would be applicable to other authorized (not just oil and gas) activities. **(Comment No. 197632-025)**

Response To: Comment 197632-025

As an ROP it will be a requirement of the lease as well as a condition of non oil and gas activities.

TOPIC: STIPULATIONS AND ROPS

ISSUE: I-1

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-26, I-1(b): the proposed orientation program must address not only the "importance of not disturbing archaeological and biological resources and habitats", but also the potential illegality of doing so. **(Comment No. 196407-071)**

Response To: Comment 196407-071

We believe it will; furthermore, as with other stipulations and Required Operating Procedures, the orientation program can be adjusted to address any issue that may not have been considered until specific information such as site location and type of development was known.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-26: ROP I-1. This states that "all personnel" involved in oil and gas related activities shall be provided with information concerning applicable stipulations, ROPs etc. This should be changed to "all field personnel", as corporate and global employees do not require such information as they do not physically enter the Planning Area. ***(Comment No. 196557-065)***

Response To: Comment 196557-065

We believe that the field personnel as well as other directing operations from outside the planning area should be aware of the requirements for operating within the National Petroleum Reserve-Alaska.

TOPIC: STIPULATIONS AND ROPS

ISSUE: K-1

Comment From: Michael R. North (Comment Letter No. 196264)

Page 2-56, Stipulation K-1.a. Colville River. Why is an exception to this provision to allow publicly funded roads within 1-mile of the Colville River needed? Why cannot publicly funded roads also be offset one-mile from the river? Is there a specific proposal for just such a public road that would benefit the oil industry? If so, that should be disclosed. If not, this exception should be eliminated. The Colville River is a critical travel corridor for big game species that are easily exploited, and a road close to the river would have profound effects on the rate of exploitation and the viability of their populations. ***(Comment No. 196264-011)***

Response To: Comment 196264-011

No proposal for the construction of a public road in this area has been submitted to BLM; however, the BLM wished to clarify that this stipulation did not preclude consideration of such a road.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-27: Stipulation K-1. This stipulation establishes setbacks measured from river banks' highest high water marks as determined by the hydrology at the time of application. CPAI suggests that the method of measurement of setbacks be consistent with that established in the Northwest Planning Area, where setbacks are measured from the centerline of rivers. Having different methods of measuring setbacks along rivers in the different planning areas will be confusing for operators. Additionally, it is likely more difficult in most cases to identify a highest high water mark, than a river centerline. ***(Comment No. 196557-066)***

Response To: Comment 196557-066

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-28: Stipulation K-1e, Fish Creek buffer. CPAI is disappointed that BLM plans to retain this 3-mile buffer on either side of Fish Creek. There is no scientific justification for this large a buffer. During the 1998 EIS process Kuukpik Corporation recommended a 1.5-mile buffer at Fish Creek and it was subsequently doubled arbitrarily to 3 miles. While CPAI appreciates BLM's consideration of CPAI's request for an exception to stipulation 39 to place proposed drill site CD6 inside this buffer as part of the Alpine Satellite Development Project, there is no guarantee that the exception will be granted or that similar requests will be granted in the future. CPAI is confident that development can occur in the Fish Creek area without significant impacts to the environment or subsistence. ***(Comment***

No. **196557-067)**

Response To: Comment 196557-067

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Conoco Phillips (Comment Letter No. 196557A2)

CPAI does not agree that the existing 3-mile buffer on either side of Fish and Judy Creeks needs to be retained. The science did not support this stipulation when it was developed in 1998 and, in our opinion, the original requested buffer of 1.5 miles is fully protective of the resources. ***(Comment No.* 196557A2-004)**

Response To: Comment 196557A2-004

The BLM considered your comments during the development of the Final IAP/EIS and associated mitigations.

Comment From: Anadarko (Comment Letter No. 197615)

K-1 Lease Stipulation: With respect to Fish Creek, this lease stipulation prohibits the placement of permanent oil and gas surface facilities within 3 miles of the bank's high water mark. We believe this provision should not be a lease stipulation and should instead be a ROP that would only be imposed if site specific analysis supports the need to impose such a restriction. Moreover, the setback should not be automatically imposed as 3 miles. If the site-specific analysis supports a shorter setback, then such a shorter one should be imposed. The same is true for the prohibition regarding the location of surface facilities within a half mile of Judy Creek. ***(Comment No.* 197615-022)**

Response To: Comment 197615-022

This particular requirement is a lease stipulation rather than an ROP because we believe it represents a legal "taking" i.e., we believe that it takes from the value of the oil and gas lease. Such a taking should be attached to a lease contract. Please see the discussion in Section 2.6, Stipulations and Required Operating Procedures, in the final IAP/EIS.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

We note that Alternatives B and C maintain essentially the same river (but not lake) setbacks as stipulation 39 of the 1998 NE NPR-A ROD, and in the case of Alternative B adds the Tingmiaksiqvik (Ubltouch) river to the rivers receiving surface buffer zone protections. Amended Draft EIS p, 2-55 - 2-57. However, these setbacks are substantially weakened under Alternatives B and C since an exception can be granted without meeting the objectives of these setbacks. ***(Comment No.* 197616-095)**

Response To: Comment 197616-095

See response to comment 196407-037 and 040 under topic Stipulations and ROPs.

Comment From: State of Alaska (Comment Letter No. 197620)

K. Biologically Sensitive Areas K- 1g Tingmiaksiqvik (Ublutuoch) River The Tingmiaksiqvik River (Ublutuoch River) contains high value resident and anadromous fish habitat, particularly in its lower reaches. This river is included in lease stipulation K-1 (Rivers) for the preferred alternative. The stipulation designates no permanent oil and gas facilities, except essential transportation crossings within one half mile of the river and notes, "this stipulation applies only to the preferred alternative." We recommend the Tingmiaksiqvik River setback stipulation be included in all alternatives, and not just in the preferred alternative. ***(Comment No.* 197620-025)**

Response To: Comment 197620-025

We have considered your comments in developing the Proposed Action, see Stipulation K-1 g under the Final Proposed Action.

Comment From: Robert Edward, Sr. (Comment Letter No. 197980)

They have been, you know, I give the industry a applause for not having had big spills, and then there's some -- some of the stipulations they created like on Ikpikpuk, you know, on Ikpikpuk River is a migrating river. It migrates. It moves and sometimes it moves 300 feet a season. And they've got a half a mile, and then how long does it take to develop a field? 30 years. Prudhoe Bay has been going strong for 30 years, and still is. What is our -- these boundaries that they are putting at a half mile, three quarter of a mile on the rivers, erodes, I mean, you know, there's some real tough questions in there. But we know that the rivers still migrate. You will see how much the rivers have moved within these years, they've moved miles. ***(Comment No.* 197980-109)**

Response To: Comment 197980-109

Once again, flexibility provided by performance-based stipulations and ROPs would provide the BLM with the ability to make the necessary revisions to accommodate, in this instance for example, the setback associated with a migrating river.

TOPIC: STIPULATIONS AND ROPS

ISSUE: K-2

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-28 thru 2-29, K-2: the exception clause embodied in the last sentence of the Requirement/Standard is overly broad, and does not provide adequate assurance of protection against the placement of permanent facilities that have the potential to cause more than "minimal" impacts. As now written, use of the word "or" would allow greater than minimal impacts when it is determined that there is "no feasible or prudent alternative". Again here, as discussed above, technical or economic infeasibility should never be the justification for allowing significant environmental or subsistence impacts. ***(Comment No.* 196407-073)**

Response To: Comment 196407-073

See response to comment 196407-062 under topic Stipulations and ROPs.

TOPIC: STIPULATIONS AND ROPS

ISSUE: K-3

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-29, K-3: it is unclear why the Requirements/Standards for exploration and development are different. One indication of just how complex and confusing these proposed protective measures are is that it is at times difficult to determine between related provisions which embodies the higher standard. Exploration criteria "a." requires that activities not "unreasonably conflict" with traditional subsistence uses or "significantly impact" seasonally concentrated fish and wildlife resources. Development criteria "a." requires that the design and construction of facilities "minimize" impacts. The applicable standards of all criteria should be made consistent in requiring that conflicts with subsistence activities be avoided. In addition, a component must be added to each criteria comparable to that of Development criteria "b." that requires assessment of the potential impacts of the proposed project "in

combination with other past, present, and reasonably foreseeable activities". Further, the lead-in to the Development criteria should conclude with the modified sentence "Activities elsewhere will only be permitted if..." to make it clear that under no circumstances will permanent facilities be permitted within the ¾ mile offshore and ¼ mile onshore buffer around Teshekpuk Lake. Finally, it is unclear why under Exploration criteria "b." there must be a demonstration of spill response capability during periods of open water when BLM has repeatedly stated elsewhere that all exploration activities would occur only during the winter. Even requiring response capability during periods of broken ice is a concern, as it implies that BLM would be willing to allow exploratory drilling to occur late enough in the spring for there to be an issue with blow-out or spill containment before break-up occurs. Here and throughout the document BLM must more clearly define the term "winter" to be tied to ice and snow cover, and not the calendar dates of December 21 through March 21. BLM must be clear that no exploration or construction activities will be permitted other than during the winter, and that seasonal exploratory drilling restrictions will be applied that will allow adequate time for the drilling of a relief well or other proven well-control measures, as well as spill containment and recovery, prior to break-up. **(Comment No. 196407-074)**

Response To: Comment 196407-074

Teshekpuk Lake, under the Proposed Action (Alternative D), has been deferred from oil and gas leasing and Stipulation K-3 has been significantly modified.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The mitigation measures that are offered in Alternatives B and C for the protection of Teshekpuk Lake (lease stipulation K-3) are also not very reassuring. We are particularly concerned about a blow-out in the lake during broken ice conditions. Alternatives B and C would allow drilling during broken ice conditions, even without demonstrated clean-up capability, if the lessee can show that there is an alternative method to prevent a well blow out. We do not believe that there is an effective method of preventing a well blow out. We do not think that the industry does either since, as we have seen with the Alpine Satellites, ConocoPhillips always wants the capability to bring in a rig to drill a relief well in the event of a blow out. Surely if it was as simple as employing alternative methods to prevent a blowout, ConocoPhillips would not be as concerned with its capability to respond to a blow out. Not only would there be no effective clean-up capability if there was a blow-out, we have to ask if a relief well would even be possible? Maybe the BLM is willing today to take on the risk that alternative methods to prevent a blowout will not fail, but if this wasn't an environmentally responsible choice in 1998, how can the BLM say that it is an environmentally responsible choice today? **(Comment No. 197616-138)**

Response To: Comment 197616-138

Teshekpuk Lake, under the Proposed Action (Alternative D), has been deferred from oil and gas leasing and Stipulation K-3 has been significantly modified.

Comment From: State of Alaska (Comment Letter No. 197620)

K-3 Lease Stipulation, Teshekpuk Lake, Pane 2-29. This stipulation would allow oil and gas exploration and development activities in Teshekpuk Lake. This stipulation is in apparent conflict with Stipulation D-1 , which prohibits exploratory drilling in fish-bearing lakes. This apparent conflict between the two stipulations should be rectified. In addition, under then Requirement/Standard (Development), the term "causeway" should be clarified because if a bottom-founded structure, a causeway would fall under the definition of "Permanent Oil and Gas Facilities" which are prohibited by this stipulation. **(Comment No. 197620-026)**

Response To: Comment 197620-026

Oil and gas leasing of Teshekpuk Lake has been deferred under the Final Proposed Action.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease Stipulation K-3a: EPA recommends that this stipulation include the consultation requirements and decision criteria that would be used to determine that exploration activities would not "unreasonably conflict" with traditional subsistence uses or "significantly impact" seasonally concentrated fish and wildlife resources. **(Comment No. 197632-028)**

Response To: Comment 197632-028

The consultation requirements outlined in ROP H-1 and H-2 apply to the entire planning area.

TOPIC: STIPULATIONS AND ROPS

ISSUE: K-4

Comment From: Michael R. North (Comment Letter No. 196264)

Page 4-219, fourth paragraph. Stipulation K-4 does NOT provide the setbacks from goose molting lakes as implied here. Stipulation K-4 allows for drilling IN THE LAKES in the Goose Molting Area. **(Comment No. 196264-015)**

Response To: Comment 196264-015

K-4 d. in the Draft did provide ¼ mile setbacks under Alternatives B and C. Under the Proposed Action key goose molting lakes are within No Surface Occupancy areas, see stipulation K-4 of the Proposed Action.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-31. K-4i. This recommendation implies that no wildlife monitoring studies will be permitted during the period May 20 to August 20, which conflicts with statements in Section 2.7 Monitoring. **(Comment No. 196557-069)**

Response To: Comment 196557-069

This project-specific stipulation was not intended to restrict flights necessary to survey wildlife to gain information necessary to meet the stated objective of the stipulation. However, flights necessary to gain this information would be restricted to the minimum necessary.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Stipulations (K-4) to protect geese in the Goose Molting Area are described on pp. 2-30/31. There is no scientific justification given for the 1/4-mile set back from Goose Molting Area lakes. Molting geese are grazers and may be found some distance from water. They are easily spooked and will run from disturbance, heading for deep water. What is the basis for believing that 1/4 mile gives adequate protection? In addition, the presence of pipelines, causeways, permanent platforms, and production equipment—allowed within the 1/4-mile buffer—takes away much of its effectiveness. The presence of any such infrastructure will require year-round servicing and monitoring, with access or observation by surface transportation or from the air, thus introducing sources of significant disturbance, even within the so-called buffer zone. **(Comment No. 197610-067)**

Response To: Comment 197610-067

The 1/4 setbacks were based on best professional judgment. In fact 1/4 mile may by more than is necessary, however, in the final Proposed Action, the protected area around the Goose Molting Lakes has been increased and is the buffers are generally greater than 1/4 mile.

Comment From: Anadarko (Comment Letter No. 197615)

K-4 Lease Stipulation: This stipulation should be revised to remove subparagraph (c). Winter exploration activities do not impact molting geese; therefore, this provision is unnecessary. ***(Comment No. 197615-023)***

Response To: Comment 197615-023

Lease Stipulation K-4.c in the DEIS would specifically protect geese "habitat". This lease stipulation has been revised relative to the final Proposed Action and continues to protect geese "habitat".

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Although Requirements/Standards (h) and (i) of proposed Lease Stipulation K-4 state that "[n]onessential" helicopter overflights "may be" suspended and restrictions on fixed-wing aircraft "may include" limits on the number of flights and flight corridors that may be used from May 20 to August 20, there is no unequivocal prohibition on these activities, which are known to impact molting geese in this area. It is unclear what constitutes a "nonessential" helicopter flight and under what conditions or upon what criteria restrictions on helicopter and fixed-wing aircraft travel would be implemented. ***(Comment No. 197618-033)***

Response To: Comment 197618-033

See response to comment 196407-011 under topic Stipulations and ROPs.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

If either the draft Preferred Alternative or Alternative C is selected, the Requirements Standards for the K-4 Lease Stipulation should be modified to protect goose molting lakes as follows:" d. Pipelines and causeways shall not be permitted in or under lakes used by molting geese." "e. Permanent oil and gas facilities, excluding pipelines, shall not be permitted within 11/2 miles of goose molting lakes." "f. Major construction activities shall not occur within 1 1/2 miles of goose molting lakes." "g. Ground traffic shall not be permitted within 1 1/2 miles of goose molting lakes." "h. Non-emergency helicopter flights shall be suspended within 1 1/2 miles of goose molting lakes from June 15 through August 20.". ***(Comment No. 197618-035)***

Response To: Comment 197618-035

Under the Proposed Action no permanent development would be allowed within approximately 216,000 acres in and around lakes in the Goose molting Area, see stipulation K-4.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Additionally, the draft acknowledges that impacts from disturbance would occur in habitats with high bird concentrations (goose molting lakes), or if species with low population numbers (brant are well below flyway objectives) or declining populations (brant) are disturbed. The draft states that effects would be mitigated by Lease Stipulation K-4. This explanation fails to note that Alternatives B and C would eliminate a stipulation that currently reduces disturbances from overflights (Pg. 2-65, Table 2-2, Air Traffic, #53), which have been demonstrated to have significant disturbance effects on molting brant (Derksen et al. 1992). The difference between Alternatives, with regard to overflight mitigation measures, is significant and should be discussed in this section. ***(Comment No. 197618-080)***

Response To: Comment 197618-080

See response to comment 197618-029 under Stipulations and ROPs.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

Impacts to molting geese north of Teshekpuk Lake continue to be a major concern with respect to potential oil development. Although Requirements/Standards (h) and (i) of proposed Lease Stipulation K-4 state that "[n]onessential" helicopter overflights "may be" suspended and restrictions on fixed-wing aircraft "may include" limits on the number of flights and flight corridors, there are no unequivocal restrictions on these activities, which are known to impact molting geese. It is unclear what constitutes a "nonessential" helicopter flight and under what conditions or upon what criteria restrictions on helicopter and fixed-wing aircraft travel would be implemented. Given the importance of this area to molting geese, the Service believes that clearly defined restrictions governing air traffic in the vicinity of the goose molting area are needed for the Final EIS. **(Comment No. 197619-033)**

Response To: Comment 197619-033

See response to comments 196407-011 and 059 under stipulations and ROPs.

Comment From: State of Alaska (Comment Letter No. 197620)

The points discussed above for protection of molting geese through air and ground traffic management (Stipulation K-4) also apply to caribou, particularly in the narrow migration corridors between the Kogru River and Teshekpuk Lake. **(Comment No. 197620-029)**

Response To: Comment 197620-029

The restrictions listed under stipulation K-4 also apply to the corridor between Teshekpuk Lake and the Kogru River. Also see stipulation K-9.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease Stipulation K-4: This stipulation should include measurable criteria that would be used to determine potential adverse impacts to critical goose-feeding habitat. EPA recommends that appropriate consultation with regulatory and resource agencies be added for the entirety this stipulation. **(Comment No. 197632-029)**

Response To: Comment 197632-029

It is not clear what is intended by "measurable criteria that would be used to determine potential adverse impacts"; if these criteria are to be used as a "yardstick" to determine the effectiveness of the stipulation to meet its stated objective, this is something more appropriately addressed as part of a monitoring plan

The requirements/standards listed under this stipulation evolved from recommendations received from waterfowl experts at a workshop sponsored by the BLM in May, 1997. Workshop panelists came from ADFG, USFWS, MMS, USGS, North Slope Borough, and industry biologists. Additional consultation requirements are noted for specific is requirements/standards.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease stipulation K-4g: Additional description of the "strategies to minimize ground traffic" should be added to this stipulation. This requirements should be developed in consultation and coordination with appropriate resource and regulatory agencies with management authority over species at risk in goose molting areas. **(Comment No. 197632-030)**

Response To: Comment 197632-030

As part of K-4 g we give several examples of strategies to minimize ground traffic including limiting the number of trips, use of convoys, and use of different vehicle types. Also, see response to Comment No. 197632-029,

Stipulations and Required Operating Procedures.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease Stipulation K-4h: This stipulation is less protective than current stipulations. This stipulation must define the "nonessential helicopter overflights" term with clear and measurable criteria. EPA recommends that this stipulation include prohibitions for overflights in and around Goose Molting Area lakes between May 20 and August 20 (except for safety emergencies) unless coordination and consultation with appropriate resource and regulatory agencies is completed and documented. ***(Comment No. 197632-031)***

Response To: Comment 197632-031

On a case by case basis, based upon project-specific information, these restrictions will be imposed. Flight restrictions such as those noted are part of ROP F-1. Also see response to comment 196407-011 under Stipulations and ROPs.

Comment From: Stan Senner (Comment Letter No. 197978)

Just a couple more items and then I'll conclude. One of the stipulations that BLM is looking at is a one-quarter mile setback around lakes, and I've yet to see one shred of evidence that that is an adequate distance for a setback to protect molting geese. Much of their activity is on the shoreline, they're really only out in the water to escape predators and disturbance. And often they're ranging farther than a quarter of a mile from lake shores. So as a setback, a quarter of a mile is simply inadequate, or I believe that it's inadequate and have seen no evidence justifying that value. ***(Comment No. 197978-096)***

Response To: Comment 197978-096

This is a legitimate comment. BLM should answer as we do not know how the setback distance was determined.

TOPIC: STIPULATIONS AND ROPS

ISSUE: K-5

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-31, K-5: the word "activities" in the last sentence of standard "a." must be defined. The sentence now introduces confusion. It should be made clear that the intent of the stipulation is to require the gathering of 3 years of baseline data to be used in the siting and design of facilities and against which post-construction impacts can be measured. ***(Comment No. 196407-075)***

Response To: Comment 196407-075

The statement seems clear: "Study data may be gathered concurrently with other activities." The objective of the study, as stated in the objective statement, is to minimize disturbance and hindrance of caribou movements through the area.

Comment From: Conoco Phillips (Comment Letter No. 196557)

CPAI has been operating in areas used by caribou for over 30 years and have always maintained a policy that caribou have the right of way across roads. Workers are required to stop and allow passage of any caribou, regardless of their numbers. We do not feel that this stipulation is warranted and suggest that specific discussions about caribou and traffic be deferred until a specific project is proposed. ***(Comment No. 196557-071)***

Response To: Comment 196557-071

We will include the proposed K-5 stipulation in the required mitigation measures in the final IAP/EIS. Any exceptions that are requested will be addressed at the permitting/authorization phase.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-32: Stipulation K-5e4. This states "Use of aircraft larger than a Twin Otter by authorized users of the Planning Area, including oil and gas lessees, from May 20 through August 20 within the Teshekpuk Lake Caribou Habitat Area, shall be for emergency purposes only." This seems to conflict with the intent of ROP F-1c which states, "During the design of proposed oil and gas facilities, larger landing strips and storage areas should be considered so as to allow larger aircraft to be employed, resulting in fewer flights to the facility." **(Comment No. 196557-072)**

Response To: Comment 196557-072

Stipulation K-5e4 is specific to the Teshekpuk Lake Caribou Habitat Area and the use of aircraft larger than a Twin Otter by authorized users of the Planning Area, including oil and gas lessees, from May 20 through August 20 within the Teshekpuk Lake Caribou Habitat Area, shall be for emergency purposes only. ROP F-1c would be applicable to the entire planning area outside of the timeframe of May 20 through August 20 within the Teshekpuk Lake Caribou Habitat Area. We do not believe there is a conflict.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Caribou Stipulations and Routine Operating Procedures: Lease stipulations and routine operating procedures (ROPs) in the Preferred Alternative do not provide the same level of conservation safeguards and precautionary management as does the 1998 plan. For example, the major stipulations to minimize impacts to caribou that use the Teshekpuk Lake Caribou Habitat Area are contained in Stipulation K-5(a-e). Although these stipulations are designed to reduce or minimize industrial impacts to caribou, there are no clear measures of their effectiveness in reducing or minimizing impacts to caribou in this important habitat area. In contrast, the 1998 plan—in recognition of the habitat values of this sensitive area—protected the area in its entirety as the TLSPA. **(Comment No. 197610-030)**

Response To: Comment 197610-030

BLM is fully aware of the significant surface resources within the Teshekpuk Lake Special Area; please see responses to comment 196407-011 under Stipulations and ROPs, 183937-005 and 196949-011 under Special Designation Areas, 186677-010 under Impact Evaluation, 196407-006 under Purpose and Need

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The Preferred Alternative offers only promises that general stipulations and ROPs, with many exceptions, will minimize impacts. For example, K-5(a) states: Before authorization of construction of permanent facilities, the lessee shall design and implement a study of caribou movement ... The study shall include a minimum of 3 years of current data on caribou movement and the study design shall be approved by the AO and should provide information necessary to determine facility (including pipeline) design and locations. **(Comment No. 197610-031)**

Response To: Comment 197610-031

See response to comment 197610-032 under topic Stipulations and ROPs.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Certainly, a three-year study would be valuable for helping design infrastructure in a way to minimize impacts to

caribou. Three years, however, is a very short time from which to develop guidelines applicable to an environment that displays high annual variability and a species that undergoes major and unpredictable fluctuations in population size and behavior. It also is relevant that a similar stipulation applied to the 1998 plan, but the study provision was never implemented, even though there have been leases sold within the areas covered by the stipulation. Broken promises do not enhance our faith in either BLM's or the industry's commitments for environmental protection in an area of high importance in the circumpolar Arctic. **(Comment No. 197610-032)**

Response To: Comment 197610-032

Additional time to do a study might be valuable but we believe three years is reasonable and adequate. We do not believe that by changing our approach to what we believe is a better way of doing business (i.e. prescriptive to performance based stipulations and required Operating Procedures) constitutes a broken promise.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Lease Stipulation K-5(c) requires that: "...leasees shall orient linear corridors when laying out oil field developments, to the extent practicable, to address migration and corralling effects and to avoid loops of road and/or pipeline that connect facilities." [emphasis added] Lease Stipulation K-5(d) states: "Ramps over pipelines, buried pipelines, or pipelines buried under the road may be required..." [emphasis added] It is unclear what stipulations like these really mean in actual on-the-ground implementation, and there is no guarantee of compliance if project costs are unfavorable. **(Comment No. 197610-033)**

Response To: Comment 197610-033

See response to comment 196407-011 under topic Stipulations and ROPs.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Another example of the uncertainty between intent and actual implementation is Stipulation K-5(e)(6), which applies to minimum aircraft heights over the Teshekpuk Lake Caribou Habitat Area. This stipulation states: "...unless doing so would endanger human life or violate safe flying practices." The likelihood of regularly applying this reasonable stipulation is low because the North Slope often experiences coastal fog and low overcast conditions requiring much lower flight levels. Clearly, the stipulations in the Preferred Alternative do not provide the same level of protection that the 1998 plan provided because industrial infrastructure and activities were simply not permitted in the TLSPA. The Preferred Alternative presents a major-but-uncalculated risk to caribou within the sensitive Teshekpuk Lake Caribou Habitat Area. **(Comment No. 197610-034)**

Response To: Comment 197610-034

Please see specifically the discussion under Section 2.6.1 - Compliance with Required Operating Procedures for a full description of the mechanisms in place to assure compliance with all components of the mitigations included in the Final Preferred Alternative.

Comment From: Anadarko (Comment Letter No. 197615)

K-5 Lease Stipulation: Subparagraph (a) should be revised to clarify what constitutes an "acceptable study." **(Comment No. 197615-024)**

Response To: Comment 197615-024

The AO will determine what an acceptable study is when site and project specific information is available.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

We are being told that maximum protection will still be achieved in spite of leasing 376,000 of the 589,000 acres that were not available for leasing in the 1998 ROD, and eliminating the 5 to 6 mile wide No-Surface Occupancy zone, and replacing these with a modest buffer zone around the shore of Teshekpuk Lake and the coast128 and restrictions on surface operations listed in stipulation K-5.129 Here's the same disconnect again. We are being told that protection equivalent to the 1998 NE NPR-A ROD will be provided when it clearly won't. Just on the face of the BLM's assertion the disconnect is clear because, if the 1998 NE NPR-A provided maximum protection by eliminating surface impacts, how can maximum protection be achievable by allowing surface occupancy? The two are not equivalent. ***(Comment No.* 197616-132)**

Response To: Comment 197616-132

BLM does not dispute that stipulations and required operating procedure can limit impacts to the same level as a decision to make lands unavailable to oil and gas leasing and development. Nevertheless, we do believe the Proposed Action presented in the Final and other action alternatives presented in the Draft provide significant protections to subsistence and surface resources and comply with BLM's regulatory responsibilities for management of the Petroleum Reserve. See response to comment 196949-011 and 183937-005 under Special Designation Areas.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Amended Draft EIS p. 2-31.Amended Draft EIS p. 1-6 indicates proposed lease stipulation K-5 provides maximum protection to the caribou calving in the Teshekpuk Lake Special Area. There is no explanation how the surface occupancy allowed under lease stipulation K-5 provide maximum surface protection as compared to the 1998 NE NPR-A ROD which does not allow any surface occupancy. ***(Comment No.* 197616-134)**

Response To: Comment 197616-134

It is a matter of controversy, thus several alternatives are presented for comment and analysis, what level of protection is both adequate (or maximum) and consistent with the requirements of the NPRPA to allow exploration of the Petroleum Reserve. See response to comment 196949-011 and 183937-005 under Special Designation Areas.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Caribou Stipulations and Routine Operating Procedures: Lease stipulations and routine operating procedures in the draft Amended IAP/EIS Preferred Alternative do not provide the same level of conservation safeguards and precautionary management as the 1998 IAP/EIS. For example, the major stipulations to minimize impacts to caribou that use the Teshekpuk Lake Caribou Habitat Area (TLCHA) are contained in Stipulation K-5(a-e). Although these stipulations are designed to reduce or minimize industrial impacts to caribou, there are no clear measures of how effective they will be in reducing or minimizing impacts to caribou in this important habitat area. For example, K-5 a states that "Before authorization of construction of permanent facilities, the lessee shall design and implement a study of caribou movement ... The study shall include a minimum of 3 years of current data on caribou movement and the study design shall be approved by the AO and should provide information necessary to determine facility design and locations." Certainly, a 3 year study would be valuable for helping design infrastructure in a way to minimize impacts to caribou. Three years, however, is a very short time frame from which to develop guidelines applicable to an environment that displays high annual variability and a species that undergoes major and unpredictable fluctuations in population size. It is also of interest that a similar stipulation applied to the 1998 IAP/EIS but it was never implemented even though there have been major lease areas sold within the areas covered by the stipulation. ***(Comment No.* 197617-081)**

Response To: Comment 197617-081

See response to comment 196407-011 under Stipulations and ROPs. Also, BLM believes that 3 years (at minimum)

of project-specific study to supplement general knowledge is both adequate and reasonable.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Lease Stipulation K-5 c requires that "...leasees shall orient linear corridors when laying out oil field developments, to the extent practicable, to address migration and corralling effects and to avoid loops of road and/or pipeline that connect facilities." Lease Stipulation K-5 d states "Ramps over pipelines, buried pipelines, or pipelines buried under the road may be required..." (emphasis added) It is unclear what stipulations like these really mean in terms of actual on-the-ground implementation. Unfortunately, there is no guarantee that these stipulations will be complied with if project costs are unfavorable. Another example, of "gray area" between intent and actual implementation is Stipulation K-5 e6, which applies to minimum aircraft heights over the Teshekpuk Lake Caribou Habitat Area "...unless doing so would endanger human life or violate safe flying practices." The likelihood of regularly applying this reasonable stipulation is probably low because the North Slope often experiences coastal fog and low overcast conditions requiring much lower flight levels. Clearly, the stipulations in the Preferred Alternative do not provide the same level of protection that the 1998 IAP/EIS provided because industrial infrastructure and activities were simply not permitted in the Teshekpuk Lake Surface Protection Area. The Preferred Alternative presents a major but uncalculated risk to caribou within the sensitive Teshekpuk Lake Caribou habitat Area. Displacement and disturbance of calving caribou and caribou seeking relief from insects could result in reduced recruitment and higher rates of mortality, which may have population-level impacts on the herd. If there is significant oil development in the Teshekpuk Lake Surface Protection Area, it may not be possible to sustain current levels of Native subsistence harvest. ***(Comment No.* 197617-082)**

Response To: Comment 197617-082

See responses to comments 196407-011 and 059 under Stipulations and ROPs and 197617-072 under Special Designation Areas.

Comment From: State of Alaska (Comment Letter No. 197620)

K-5 Lease Stipulation - Teshekpuk Lake Caribou Habitat Area. a. This standard requires a three year study of caribou movements, with the study design approved by the Authorized Officer (AO). Stipulation 29 of the 1998 ROD currently in effect provides for the caribou study design to be approved by the A0 in consultation with the Research and Monitoring Team. We request stipulation K-5a be modified to include approval of the caribou study design in consultation with appropriate state, federal, and North Slope Borough regulatory and resource agencies. ***(Comment No.* 197620-028)**

Response To: Comment 197620-028

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Edward Itta (Comment Letter No. 197980)

I further state that in Stipulation 29, while it is a compromise, somewhere the number of $500,000 as a limit by all lessees for the study is stated. I feel that this number is inadequate. ***(Comment No.* 197980-058)**

Response To: Comment 197980-058

Unlike the prescriptive stipulation 29 which you have identified in your comment, lease stipulation K-5 - Teshekpuk Lake Caribou Habitat Area - has an objective that requires the lessee/permittee to minimize disturbance and hindrance of caribou or alteration of caribou movements through potions of the TLCHA that are essential for all season including calving and rearing, insect relief, and migration. The dollar amount that would be required to perform the

TOPIC: STIPULATIONS AND ROPS

ISSUE: K-6

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-32, K-6: the Barrow Whaling Captains' Association should be added to the list of parties to be consulted before open water activities can be conducted. The potential influence of Northeast NPR-A activities on Barrow hunters was made clear when barge operations associated with staging at Camp Lonely impacted Barrow subsistence whaling during the fall of 2003. Here also, the door seems open to an exception that would allow permanent facilities based solely on economics or "other factors". To say that due to such factors, the BLM may concur with a lessee's conclusion that a facility "must" be located within ¾ mile inland of the coastline begs the question as to how the agency will prioritize uses and surface values in the area. The issue of how BLM will balance competing values when faced with a proposed development, after huge sums of money have been spent on leasing and exploration, is central to our concern with a conversion to performance-based measures. The likelihood that it will institutionally and politically more difficult for BLM to reject a project or a request for an exception to a mitigation measure under those circumstances must be acknowledged by the agency. Our concern that there would be a "slippery slope" to development greased by economics, power, and influence is compounded by loose and vague language like that contained in this and other stipulations and ROPs. **(Comment No. 196407-076)**

Response To: Comment 196407-076

The Barrow Whaling Captains' Association has been added to the list of parties to be consulted before open water activities can be conducted under Stipulation K-6, Coastal Area. Also, see response to comment 196407-011, Stipulations and ROPs.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.6.2.3, Paae 2-32, K-6 Stipulation: We recommend adding to the Objective paragraph the words ". ..prevent alteration to or loss of habitat used by polar bears for denning, feeding, and seasonal movements.". **(Comment No. 197618-036)**

Response To: Comment 197618-036

See ROP C-1.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease Stipulation K-6,K-7: EPA recommends that the coordination and consultation that was conducted with resource and regulatory agencies and used to develop these stipulation be clearly described. **(Comment No. 197632-032)**

Response To: Comment 197632-032

The restrictions in K-6 evolved from recommendations received from caribou experts at a workshop sponsored by the BLM in May, 1997. Workshop panelists came from ADFG, USFWS, MMS, USGS, North Slope Borough, and industry biologists.

This comment (197632-032) also has a response under topic Stipulations, subtopic K-7.

TOPIC: STIPULATIONS AND ROPS

ISSUE: K-7

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-32 thru 2-33, K-7: the phrase "if necessary" beginning the Requirement/Standard for Permanent Facilities must be clarified. It is not specified under what conditions it would be "necessary" to construct permanent facilities within the Colville River Special Area. Unless it is based on the identification of an environmentally preferable alternative, and with a demonstration that the objective of the stipulation is fully met, an exception is not "necessary" and should not be granted. The Requirement/Standard for Activities is confusing and appears internally inconsistent. The restriction applies "during the winter", yet goes on to say that motorized ground-vehicle use shall be minimized from April 15 through August 5. Exceptions where "no feasible or prudent alternative" is available would allow significant alteration of high quality raptor foraging habitat within 15 miles of nests and "essential" pipeline and road crossings through ponds, lakes, wetlands, and riparian habitats. The proposed ROP represents a significant weakening of the comparable existing Stipulation 24. As with many other proposed stipulations and ROPs, the exception here swallows the rule. Key terms are undefined, and no criteria are given that would govern the granting of exceptions. As noted above, the result is that the Borough and other reviewers have no real sense of how much protection is embodied in the proposed mitigation measures, and what impacts to the environment, wildlife resources, and subsistence are possible or even likely. **(Comment No. 196407-077)**

Response To: Comment 196407-077

The dates April 15 to August 5 and March 15 to August 5 are correct and meaningful because, even though much of the time period is within the summer season, winter conditions and activities often continue beyond March or April 15. Also see response to comment 196407-062 under topic Stipulations and ROPs.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

In addition to the Stipulations and ROPs proposed in the DEIS for the Colville River Special Area, the Service recommends permanent facility setbacks of at least 2 miles from the northern and western bluffs of the river due to the unusual concentration of nesting raptors in these areas and the uncertainty regarding how these birds would react to disturbance within this corridor. The larger buffer also would enhance the protection of adjacent habitats used as foraging areas by raptors. We also recommend that roads, if necessary, be minimized to a single consolidated crossing of the Colville River and CRSA, and that aircraft be restricted to altitudes of at least 1,500 feet AGL within 1/2 mile of cliffs identified as raptor nesting areas from March 15 - August 5. **(Comment No. 197619-034)**

Response To: Comment 197619-034

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease Stipulation K-6,K-7: EPA recommends that the coordination and consultation that was conducted with resource and regulatory agencies and used to develop these stipulation be clearly described. **(Comment No. 197632-032)**

Response To: Comment 197632-032

The K-7 requirements/standards evolved directly from recommendations received from raptor experts at a workshop sponsored by the BLM in February, 1999. Workshop panelists came from ADFG, USFWS, USGS, North Slope Borough, university, and industry biologists.

This comment (197632-032) also has a response under topic Stipulations, subtopic K-6.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Lease Stipulations K-7: EPA recommends the BLM delete the exception clauses included in this stipulation, in order to provide the maximum protection for significant wildlife resources in the Colville River Special Area, as mandated by the Naval Petroleum Reserves Production Act. ***(Comment No. 197632-033)***

Response To: Comment 197632-033

What constitutes appropriate protection to protect significant surface resources within the Petroleum Reserve must be consistent with the purposes of the Act and is at the discretion of the Secretary of the Interior. Section 104 (b) of The Naval Petroleum Reserves Production Act (NPRPA) referring to special areas says: "Any exploration within the Utukok River, the Teshekpuk Lake areas, and other areas designated by the Secretary of the Interior containing any significant subsistence, recreational, fish and wildlife, or historical or scenic value, shall be conducted in a manner which will assure maximum protection of such surface values to the extent consistent with the requirements of this Act for the exploration of the reserve" (emphasis added). Only exploration, not development, was specified in Sec. 104(b) because Section 104 (a) of the NPRPA expressly prohibited production and development leading to production of petroleum. It was Public Law 94 – 514 (December 12, 1980) that directed the Secretary to conduct an expeditious program of competitive leasing of oil and gas in the Petroleum Reserve. In so doing, PL 94 – 514 said activities undertaken pursuant to this Act shall include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on surface resources of the National Petroleum Reserve in Alaska . . ." emphasis added.

TOPIC: STIPULATIONS AND ROPS

ISSUE: PERFORMANCE VS. PRESCRIPTED

Comment From: Tom Paragi (Comment Letter No. 143335)

Further, BLM has not followed through on the 1998 Record of Decision for a research advisory team to ensure "monitoring will be undertaken to determine the status of the various resources in the planning area...and to measure the effectiveness of protective measures" (p. 21). This disturbs me because the BLM website for the DEIS (http://69.20.72.207/nenpra/default.html) describes the intent of BLM to implement "performance-based measures" instead of existing "prescriptive stipulations [which] are very specific and in some cases inappropriately or needlessly restrictive [of development practices]." Performance-based measures are a type of adaptive management that is by its nature a trial-and-error process; without appropriate testing, they could be used to permit less conservative measures for habitat protection until enough time had passed to evaluate problems. I do not believe that present energy needs in the U.S. justify taking such a risk with the rich biological values of NPR-A Northeast. ***(Comment No. 143335-004)***

Response To: Comment 143335-004

The Research and Monitoring Team (RMT) was re-established and tasked with developing a monitoring plan for Northeast NPR-A. This group is proceeding to develop such a plan.

Comment From: The Wildlife Society (Comment Letter No. 191279)

TWS opposes replacing the 79 existing stipulations with Performance-based Lease Stipulations and Required Operating Procedures (ROPs). Although the IAP/EIS repeatedly states the proposed Performance-based Lease Stipulations and ROPs will protect resources and mitigate adverse impacts associated with oil and gas leasing and development, this statement assumes that: 1) Performance-based Lease Stipulations and ROPs will be implemented and enforced consistently, and 2) they will be effective in achieving mitigation objectives. Because of the subjective nature of the proposed measures, TWS does not believe these two assumptions can be met. ***(Comment No. 191279-006)***

Response To: Comment 191279-006

BLM strongly believes that performance based stipulations and Required Operating Procedures and the greater flexibility they offer to adapt requirements/standards to specific situations and to modify the requirements/standards if they prove ineffective, not only are adequate but will increase, not decrease, our ability to protect surface resources and subsistence use. Prescriptive based mitigation often attempts to define a requirement with a one size fits all approach that does not allow adjustments when site and project information is available. The stipulations and Required Operating Procedures that have been developed for the Action alternatives are intended to allow BLM through its

Comment From: Michael R. North (Comment Letter No. 196264)

The prescriptive based stipulations need to be maintained. The performance-based stipulations are often too vague and unenforceable, nor are they consistent. For example, in the Executive Summary of the EIS, in the shaded box, is a statement that the minimum height of any new pipeline would be 7 feet; in the BLM press release already referenced is a statement they would be 5 feet. These inconsistencies do not allow reviewers to fully understand exactly what is being proposed. For another example, on page 3 of the executive summary is another performance based stipulation: "minimize disruption of caribou movement". "Minimization" is impossible to measure, hence unenforceable. Another example: on page 2-19 Stipulation D-1 states exploratory drilling is prohibited in fish bearing lakes. But in reality its not, because drilling is being allowed in goose molting lakes and Teshekpuk Lake (see p.2-29, 2-78). Another example: top of page 2-21, a requirement is "consideration shall be given ..." How is "consideration" measured and enforced? On page 2-24 (Stipulation F-1.e.) is the statement, "Aircraft use ... in the Goose Molting Area should be minimized ..." "Should be" and "minimized" are two vague concepts; how are they measurable and enforceable? On p. 2-31, Stipulation K-4.h., what are "nonessential helicopter overflights"? Are oil companies expending revenues on flights they consider frivolous, or would they consider every flight "essential"? And on the same page Stipulation K-4.i. states, regarding overflights in goose molting area, "... restrictions may include ..." How is this enforceable? ***(Comment No. 196264-006)***

Response To: Comment 196264-006

The stipulations and Required Operating Procedures that have been developed for the Action alternatives are intended to allow BLM through its permitting and authorization process (see Chapter 2 section 2.6.2.1) to use project specific information to define what "minimize" or "nonessential" will mean specific to the project at hand. We believe this is a far more effective approach than to try to define these standards using a "one size fits all" approach based on hypothetical situations. Conditions imposed on these project specific authorizations are every bit as enforceable as lease stipulations. The Proposed Action uses a minimum height for above ground pipelines of 7 feet.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

All protections afforded by the existing prescriptive mitigation measures must be carried forward if there is a shift to performance-based mitigation. We cannot support a change from the existing prescriptive mitigation structure to the proposed performance-based structure unless we can be assured that all protections provided by the 79 stipulations of the 1998 plan are preserved or enhanced. It is not clear from the proposed measures as they are now written that current protections will be fully carried forward. Central to BLM's position with respect to a shift to performance-based mitigation is the assertion that the conversion is one largely of form and that there would be no added impacts associated with the move. We do not agree with the conclusion, and believe that a central question must be whether additional impact-producing activities would be permitted to occur under the performance-based system that would not have been permitted under the prescriptive mitigation system. We believe that additional activities clearly would be permitted under the proposed performance-based measures as they are now written, and that additional impacts would occur. If additional unacceptable impacts are to be avoided, the measures must be significantly modified. ***(Comment No. 196407-011)***

Response To: Comment 196407-011

BLM strongly believes that performance based stipulations and Required Operating Procedures and the greater

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Second, in order to truly provide the same protections now provided by the prescriptive measures, implementation of the adaptive management concepts must allow not only for adjustments in the management of successive projects over time, but also must provide the ability to require changes in the facilities and operation of a single project where monitoring has revealed significant impacts beyond those predicted and beyond a level that would have been permissible under the prescriptive structure. This is a primary concern with the proposed conversion. What we do not want to see are facilities and operations being allowed and causing impacts that would not now be allowed, and there being no recourse to act after the fact to reduce those impacts. We do not want to find BLM and other agencies simply declaring that they will do a better job with the next project. **(Comment No. 196407-014)**

Response To: Comment 196407-014

Regardless of the approach used (i.e., prescriptive vs. adaptive) once a facility is constructed, although operational procedures can be modified, the extent of modifications that can be made to the actual facility will likely be limited. Again, this is why we believe it is important to have project-specific information in hand before we try to be too specific in identifying required design features and other operating requirements.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Third, under a truly adaptive, flexible, and performance-based management approach, exceptions would seem unnecessary. The burden must be unwaveringly on the applicant to meet stated objectives and performance criteria. Criteria unrelated to the particular objective of a measure, such as technological infeasibility and economics, must never be invoked to allow an applicant to circumvent that central objective. A performance-based measure with a built in exception clause that is triggered by criteria not related to its objective cannot honestly be called performance-based. **(Comment No. 196407-015)**

Response To: Comment 196407-015

We agree that the proposed Stipulations and Required Operating Procedures should largely eliminate the need to grant exceptions. We do not agree that this is because the proposed Stipulations and Required Operating Procedures have built in exception clauses unrelated to the stated objective but rather that many of the Stipulations and Required Operating Procedures allows us to adapt the standards and requirement to meet the objectives based on project and site specific information.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

We also object to substituting performance-based stipulations and required operating procedures for the existing 79 prescriptive stipulations because they fail to provide the same level of conservation safeguards and precautionary management. In conclusion, we are surprised and disappointed that BLM rolled back the Teshekpuk Lake Surface Protection Area safeguards—established in the 1998 Record of Decision—without providing any scientific evidence justifying this risky management action. **(Comment No. 197610-005)**

See response to comment 196407-011 under Stipulations and ROPs - Performance vs. Prescripted

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

Recently, the BLM released a ROD for the NW Reserve. This ROD calls for weaker, more discretionary stipulations than the original NE ROD. In revising the NE plan to include stipulations similar to those in the NW BLM fails to explain how it will meet its obligations to protect wildlife and other values in the Reserve. Specifically, the public needs to see how BLM addresses several issues: how performance-based measures will be implemented; the effectiveness of the stipulations in the NW; and what format the Alpine Satellite Development will take. **(Comment No. 197614-009)**

Response To: Comment 197614-009

See response to comment 196407-011. The Alpine Satellite Development Project is beyond the scope of this plan amendment.

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

Now BLM proposes to further weaken these stipulations by removing many mandatory minimum restrictions and replacing them with vague standards. These are subject to abuse, as they come under the influence of profit oriented petroleum executives. The SEIS must contain scientific evidence proving that further modifying and/or waiving the already weak NE stipulations will provide adequate environmental safeguards. Specifically, the SEIS must address the issues highlighted by the NRC report on winter travel, seismic, restoration, groundwater and water withdrawals. ***(Comment No.* 197614-025)**

Response To: Comment 197614-025

The final document includes many references to the National Research Council Report regarding oil and gas activities on the North Slope; however, the NRC report is just one of many documents, literature, data, etc. that was used in developing the final document. All alternatives considered address winter travel, seismic, restoration, groundwater and water withdrawals, see Chapter 2, Section 2.6.2 - Stipulations and Required Operating Procedures in the FEIS; also see response to comment 196407-011.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

In our NE NPR-A Scoping Letter we gave the BLM multiple reasons why the prescriptive mitigation measures in the NE NPR-A ROD are superior to the performance-based mitigation measure that the BLM has decided to adopt. See NE NPR-A Scoping Letter pp. 10 -12, pp. 23- 26 and pp. 3 through 7 of the April 2, 2003 letter from Kuukpik and KSOP to Curtis Wilson commenting on the Northwest NPR-A Draft EIS, incorporated into the NE NPR-A Scoping Letter. These were more than just arguments why the BLM should not take the course it has chosen. These were also comments on the proposed change from the 1998 NE NPR-A ROD to the performance-based mitigation measures that basically the entire community of Nuiqsut specifically asked the BLM to consider and to address in the Amended Draft EIS. NE NPR-A Scoping Letter p. 24. The Amended Draft EIS does not address the loss of the advantages of prescriptive-based management that we identified during scoping. However, at page 4-184 the Amended Draft EIS does confirm that greater specificity, one of the advantages of prescriptive-based mitigation measures that we identified, provides greater protection. The BLM should have considered the lost advantage that greater specificity provides to mitigation measures and the other advantages of 1998 NE NPR-A ROD's stipulations that we identified during scoping as significant issues that needed to be analyzed in depth in the Amended Draft EIS. Since it did not, we specifically incorporate pp. 10-12, pp. 23- 26 of the NE NPR-A Scoping Letter and pp. 3 - 7 of the April 2, 2003 letter from Kuukpik and KSOP to Curtis Wilson commenting on the Northwest NPR-A Draft EIS. We expect the BLM to address the lost advantages of prescriptive-based management in the Final EIS as required by 40 CFR 1503.4. ***(Comment No.* 197616-045)**

Response To: Comment 197616-045

See response to comment 196407-011 under topic Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The Amended Draft EIS points to a couple of instances (such as the ROP that sets a standard pipeline height of 7 feet measured at the VSMs) where Alternatives B and C would provide more protection than the 1998 NE NPR-A ROD and therefore concludes that the overall level of protection is similar or greater than the 1998 stipulations.81 Nothing could be farther from the truth. ***(Comment No.* 197616-088)**

Response To: Comment 197616-088

See response to comment 196407-011 under topic Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

For instance, the proposed mitigation packages for Alternatives B and C uniformly allow exceptions to their standards with a lesser showing than the 1998 NE NPR-A ROD. The impacts of this difference are not analyzed in the Amended Draft EIS, as they are required to be. The exception clause in the 1998 NE NPR-A ROD provides: [see comment 197616-090] ***(Comment No. 197616-089)***

Response To: Comment 197616-089

See response to comment 196407-037 and 040 under topic Stipulations and ROPs.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Another sweeping difference in the mitigation measures that cuts across all types of protection (and again that is not considered in the discussion of the impacts of the Preferred Alternative) is the shift in emphasis from enforceable standards to monitoring the effectiveness of new mitigation techniques. The Amended Draft EIS claims that many of the prescriptive "stipulations [in the 1998 NE NPR-A ROD] reflect knowledge gained from past mistakes".91 But, as the Amended Draft EIS puts it "[t]he flexibility of the new approach [Alternatives B and C] places greater reliance on on-going monitoring to insure that modified procedures do in fact achieve equivalent protections."92 We call this the "close the door after the cow is out" approach because it assumes that there is not a problem until the harm has occurred. Additional, unnecessary environmental impacts will inevitably result from substituting after-the-fact monitoring for impacts for standards that make a lessee show an acceptable level of impacts before those impacts occur. It is simply not possible that the after-the-fact monitoring proposed as part of the ROPs and stipulations in Alternatives B and C will provide a comparable level of protection to subsistence resources as now exists. ***(Comment No. 197616-099)***

Response To: Comment 197616-099

The stipulations and ROPS presented as part of the action alternatives are not that dissimilar to the79 stipulations from the 1998 NE NPR-A ROD in that the resource objectives are the same, but now are clearly stated; and the requirements and standards listed in the new Stipulations and ROPS also reflect knowledge gained through past experience, but now allow greater opportunity to be refined based on new information and experience. Monitoring to insure that the requirements and standards are effective and are accomplishing the desired result we believe to be a good thing and a more meaningful exercise if ineffective measures can be strengthened. Also see response to comment 196407-011 under Stipulations and ROPs

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The BLM may be content to learn from new mistakes in order to push through the current Presidential administration's policy, but it's our culture and way of life that is on the line. We are essentially being told by the BLM to leave it up to their good judgment. But in doing so, we must rely on the BLM to exercise its discretion (our scoping letter discussed extensively the lesser level of protection afforded by a discretionary system such as that proposed here, and that discussion is incorporated by reference.)93 The more discretion that the BLM has in the management of the Northeast NPR-A, the less legal recourse we have to challenge whether those decisions provide an appropriate level of surface resource protections. We are not saying that we think that the best way to manage the Northeast NPR-A is through court injunctions. But when the BLM recognizes that amending the 1998 NE NPR-A ROD will create an "insurmountable rift" between it and the people of the North Slope, and is willing to do it anyway, the protection of our way of life may rest only with higher authority. Reliance on the BLM to exercise its discretion is also not very comforting given the Amended Draft EIS's reliance on justifications that disguise rather than illuminate the real

policy-based motivations underlying this process, not to mention the failure of the Amended Draft EIS to adequately disclose or consider the real impacts that would result. ***(Comment No.* 197616-100)**

Response To: Comment 197616-100

BLM is committed to its regulatory responsibility to take such action as deemed necessary to mitigate or avoid unnecessary surface damage to minimize ecological disturbance throughout the Petroleum Reserve consistent with the requirements of the Naval Petroleum Reserves Production Act (43 CFR 2361.1).

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Given Congress' mandate for "maximum protection,"160 and the least averse impacts on subsistence, the BLM's preference for after-the-fact monitoring instead of prescription poses especially great risks. The ROP's "close the door after the cow is out" approach161 poses huge risks for our subsistence resources, our culture, and our people, but this is the low level of the analysis. ***(Comment No.* 197616-167)**

Response To: Comment 197616-167

See responses to comments 183937-005 under special Designation Areas, 197616-099 under Stipulations and ROPs and 197616-101 under Mitigation for Compliance.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Molting Goose Stipulations and Routine Operating Procedures: In general, performance based stipulations and routine operating procedures provide more room for subjectivity, lack of consistency, and less conservation rigor than prescriptive stipulations. In comparison to the 1998 ROD, the changes we see in the draft IAP/EIS concern us. ***(Comment No.* 197617-092)**

Response To: Comment 197617-092

BLM strongly believes that performance based stipulations and Required Operating Procedures and the greater flexibility they offer to adapt requirements/standards to specific situations and to modify the requirements/standards if they prove ineffective, not only are adequate but will increase, not decrease, our ability to protect surface resources and subsistence use. Prescriptive based mitigation often attempts to define a requirement with a one size fits all approach that does not allow adjustments when site and project information is available. The stipulations and Required Operating Procedures that have been developed for the Action alternatives are intended to allow BLM through its permitting and authorization process (see Chapter 2) to use project-specific information (that does not now exist) to refine the requirements and define in the context of the project what such standards as "minimize" or "nonessential" will mean. We believe this is a far more effective approach than to try to define these standards using the "one size fits all" approach based on hypothetical situations. Conditions imposed on project specific authorizations are every bit as enforceable as lease stipulations.

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM has not provided any justification for its decision to radically deviate from the protections required in the 1998 Northeast ROD. To do so, BLM should review the effectiveness of the stipulations from the Northeast ROD before determining which, if any, requirements should be changed. The review should include a report of the frequency and associated reasons for modifying and waiving stipulations in the Northeast Planning Area. Moreover, the draft IAP/EIS should contain scientific evidence that the stipulations will be adequate in mitigating impacts to an acceptable level. Similar stipulations on industrial development within oil fields have had a checkered history in preventing habitat loss and degradation elsewhere across the North Slope. Additionally, some rationale should be provided for downgrading some protections from stipulations to Required Operating Procedures (ROPs). ***(Comment No.* 197617-167)**

Response To: Comment 197617-167

The stipulations and required operating procedures are an integral part of each of the action alternatives. As such the analysis of each alternative is addressing the effectiveness of proposed mitigation; also see responses to comments 196407-011, 196407-035, and 197616-099 under Stipulations and ROPs.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Page 5, Summary of Impacts: Here and throughout the DEIS (pages 1-5,2-3,2-6,2-11), it is suggested that the current stipulations (No Action Alternative) "do not allow for modification or change" or are otherwise inflexible and, therefore, less amenable to Adaptive Management Concepts than the proposed performance-based stipulations and ROPs. It is not clear in the DEIS how this conclusion was reached. For example, stipulations found in the No Action Alternative can be exempted, and will be exempted if the Alpine Satellites Development is approved as currently proposed. It has been our experience that resource agencies, Native organizations or other stakeholders are willing to consider exemptions to existing stipulations if they are warranted both scientifically and economically. Indeed, the intent of the Research and Monitoring program authorized for the Northeast Planning Area was to evaluate the effectiveness of proposed stipulations and recommend changes where appropriate. **(Comment No. 197618-009)**

Response To: Comment 197618-009

The goal of developing more flexible requirements is not to make granting exceptions easier but to allow site and project specific information to be considered during the permitting/authorization process so that requirements and standards can be adjusted to more effectively meet the resource objective; also see response to comment 196407-062.

Comment From: USFWS Anchorage (Comment Letter No. 197619)

The Service has concerns with several aspects of the proposed Stipulations and ROPs. Throughout the DEIS it is stated that these measures will provide protection for a variety of resources and will mitigate adverse impacts associated with oil leasing and development. This statement is based on the assumptions that 1) Stipulations and ROPs will be implemented and enforced consistently, and 2) they will be effective in achieving mitigation objectives; neither is assured. Many of the Requirements/ Standards contain language suggesting implementation will be subjective and, therefore, inconsistent (e.g. pg. 2-15 "All feasible precautions shall be taken...," pg. 2-17 "...may be authorized," "...prohibited unless authorized," pg. 2-18 "...may be required"). Additionally, lessees may be granted exemptions from Stipulations and ROPs if they are able to demonstrate that the impacts of their activities would be minimal, or that implementing the measure is technically not feasible or economically prohibitive. However, the criteria that would be used to determine minimal impact, technical and economic feasibility, and thresholds for granting exemptions are not clearly defined. Even if implemented and enforced, the effectiveness of the proposed mitigation measures remains unknown. These uncertainties should be clearly articulated in the final EIS. **(Comment No. 197619-029)**

Response To: Comment 197619-029

See response to comment 196407-011 and 196407-062 under Stipulations and ROPs.

Comment From: State of Alaska (Comment Letter No. 197620)

STIPULATIONS AND REQUIRED OPERATING PROCEDURESA. General Comments. However, some prescriptive measures (e.g., altitude restrictions, minimum distances from active bear dens) should be retained as they provide clearly defined operational criteria that can be understood and met during field operations. Procedural consultation with affected subsistence interests and expanded caribou studies should provide additional timely information with which to evaluate proposed activities. **(Comment No. 197620-016)**

Response To: Comment 197620-016

We agree, see the description of our permitting/authorization process and the Proposed Action Stipulations and

Comment From: Isaac Nukapigak (Comment Letter No. 197973)

The proposed Draft Amendment of the Northeast NPR-A record of decision, that was -- that was set in '98. The 79 stipulations that are vital to our community. These protections that we see that are very vital to our subsistence lifestyle and by trying to -- and making it a proposed amendment to replace these vital protections that we had, by with setting up a performance base stipulations. By my view, I see that you are -- the strength of the stipulations are being weakened and I would suggest strongly to BLM that these stipulations just be in place. Because these are a very vital area. ***(Comment No.* 197973-058)**

Response To: Comment 197973-058

See response to comment 197632-003 under Stipulations and ROPs

Comment From: Charles Brower (Comment Letter No. 197980)

A performance-based mitigation system requires a long-term commitment to fund research, monitoring and enforcement. Performance based mitigation can only work if there is a clear requirement for a long-term comprehensive research and monitoring to establish baseline data and impacts associated with industrial operations. There must also be the ability to require significant alterations in industrial operations if impacts are identified. ***(Comment No.* 197980-027)**

Response To: Comment 197980-027

Performance-based mitigation would be most effective after a concise and comprehensive research and monitoring protocol is developed and implemented. The Research and Monitoring Team (RMT) was re-established and tasked with developing a monitoring plan for Northeast NPR-A. This group is proceeding to develop such a plan.

Comment From: Geoff Carroll (Comment Letter No. 197988)

Another weakness in the Plan is the use of exception clauses in the stipulations. Exception clauses allow the economics of a project to dictate to what degree protective measures are applied. This was brought to light in the Alpine Satellite Development Project where BLM will apparently use an exception clause to allow a drill pad in the Fish Creek Subsistence Setback for economic reasons. This giant loop-hole takes away much of the protection that stipulations have to offer. A setback should be a setback, it shouldn't be a setback until oil is found. And, you know, it goes with many of the stipulations that affect dealing with wildlife. You know, there shouldn't be exceptions for economic reasons. There should be rules that are set and they should be -- they should remain in spite of other circumstances. The exception clauses make it more likely that wildlife populations will be reduced, that the movements to subsistence populations will be affected and make it more likely that access to subsistence species will be reduced, again, you know, as in the Alpine example. ***(Comment No.* 197988-221)**

Response To: Comment 197988-221

See response to comment 196407-037 under Stipulations and ROPs - Exception Process

TOPIC: STUDIES

Comment From: June Huyett Thomas (Comment Letter No. 195059)

The National Academy of Sciences March 2003 Report, Cumulative Effects of Oil and Gas Activities on Alaska's North Slope documents environmental and cultural degradation that has occurred as a result of three decades of oil development. ***(Comment No. 195059-004)***

Response To: Comment 195059-004

This document was referenced extensively when preparing the Amended IAP/EIS.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Table 2-2, Page 2-52, Facility Design and Construction: Along with the 3-year caribou movement study, we suggest a similar length study be conducted on breeding birds at the proposed site to inventory the presence of endangered, threatened, candidate/petitioned and BCC species. ***(Comment No. 197618-039)***

Response To: Comment 197618-039

do require surveys for at least three years in the USFWS North Slope eider survey area and within 1 mile of lakes 25 acres or large, see Required Operating Procedure E-11.

TOPIC: SUBSISTENCE

Comment From: Kristi Espinoza (Comment Letter No. 118849)

a negative impact not only to the ecosystem, but to american citizens as well - many Alaska Natives depend on the herd as a subsistence resource. Take away their food by passing the current proposal, and you threaten their lives. ***(Comment No. 118849-006)***

Response To: Comment 118849-006

The impact of the undertaking on subsistence uses is addressed in the EIS (e.g., sections 4.3.12, 4.4.12, 4.5.12).

Comment From: Sarah McGiffert (Comment Letter No. 187460)

The 45,000-animal Teshekpuk Lake Caribou Herd will be threatened by development. This would have an impact on many Alaska Natives who depend on the herd as a subsistence resource. ***(Comment No. 187460-005)***

Response To: Comment 187460-005

Impacts on subsistence uses from the proposed undertaking are discussed in the EIS in Sections 4.3.12, 4.4.12, 4.5.12.

Comment From: Charles Barnwell (Comment Letter No. 193638)

Access to subsistence-hunting areas and subsistence resources, and the use of subsistence resources would change if oil development were to reduce the availability of subsistence resources or alter their distribution patterns. The communities of Anaktuvuk Pass, Atqasuk, Barrow, and Nuiqsut would be most affected. Caribou could become unavailable, undesirable for use, or experience long-term population and productivity effects for a period longer than 5 years. These effects could disrupt sociocultural systems in the communities that are reliant on caribou for

subsistence. Effects would be expected to disrupt community activities and traditional practices for harvesting, sharing, and processing subsistence resources. ***(Comment No. 193638-003)***

Response To: Comment 193638-003

These impacts are addressed in the EIS (e.g., sections 4.3.12, 4.3.13, 4.4.12, 4.4.13, 4.5.12, 4.5.13)

Comment From: Aaron Wernham (Comment Letter No. 195986)

Alaskan Natives have had to shift the season of Bowhead hunting, and this may coincide with the season of increased boat traffic in the area. ***(Comment No. 195986-004)***

Response To: Comment 195986-004

This is not addressed in EIS as exploration activity and resulting development activity would be primarily on land. The authors do not have data on increases in boat traffic from these regulatory changes.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The subsistence users themselves must confirm any new subsistence information. If BLM has new information relating to subsistence species or uses in the Planning Area, that information should be shared, discussed, analyzed, and corroborated with the affected North Slope communities as was done in a subsistence workshop during preparation of the 1998 EIS. ***(Comment No. 196407-025)***

Response To: Comment 196407-025

BLM's planning process allows many opportunities for public involvement. Furthermore, to allow additional time for North Slope residents to review and comment, BLM extended both the scoping and the Draft comment periods for the Northeast amendment. Also, in addition to public meetings held in all affected North Slope communities during the Draft comment period, the BLM held separate ANILCA 810 meetings in Barrow, Anaktuvuk Pass, Nuiqsut and Atqasuk after the close of the Draft comment period (also see Chapter 5 Consultation and Coordination).

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Fish form an important nutritional and cultural staple of the coastal Inupiat diet in Arctic Alaska. This is generally not well known or described in the literature (Braund 1993). Most research has focused on the Inuit's reliance on and associations with marine mammals. The broad whitefish, or Aanaakliq, is perhaps the most important fish resource in the central North Slope, much of which is encompassed by NPR-A. As many as 30,000 fish are taken by the Barrow residents in a single year (Braund, 1993). Over 150 years ago R. Maguire, Commander of the HMS Plover during the Franklin search, commented on the people of Point Barrow:
"October 24, 1853 ....The people seem to depend a good deal this season upon the fish and Venison brought in from the land, as parties are continually setting out to assist in bringing in what is already on the way or in procuring other supplies. They still try for small fish along the cracks in the ice but their success is indifferent....." (Bockstoce, 1988).

This pattern has changed little if at all. Broad whitefish from the NPR-A and surrounding area are traded for other resources between communities across the North Slope. Clearly, this resource really has Slope-wide importance. ***(Comment No. 196407-028)***

Response To: Comment 196407-028

This is interesting information and has been added to sections 3.4.2 and 4.3.12, Subsistence.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-84, Subsistence Harvest Patterns: here gain, it is counterintuitive to conclude that cumulative effects would be similar under all three alternatives. The differences in potential impacts between alternatives themselves would indicate a difference in their contributions to regional cumulative effects. In addition, as explained above, Alternatives A, B, and C, respectively, would increasingly enhance the likelihood of industrial expansion into the Northwest Planning Area, with a correspondingly increased level of cumulative effects. ***(Comment No. 196407-083)***

Response To: Comment 196407-083

The text in Table 2-3 has been revised to note that cumulative effects to subsistence-harvest patterns would increase as a result of implementation of the action alternatives. The general effects given under alternatives B and C do recognize that the magnitude and extent of effects would increase as the amount of area developed increases.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 3-126: the household subsistence data presented is very confusing and poorly organized. It must be cleaned up. There is reference on pages 3-126 and 3-127 to 414 households. It is not clear what the parenthetical "(84%)" refers to with respect to the mention of these households under the barrow heading on page 3-127. Also, a "Nuiqsut" heading appears to have been left out on that page. In the discussion of Nuiqsut responses to the 1998-1999 Borough census survey, the terms "household", "resident", and "respondent" appear to be improperly used interchangeably. The latter two terms would imply that answers referred to subsistence food use by an individual, when "household" correctly represents the focus of the survey. ***(Comment No. 196407-090)***

Response To: Comment 196407-090

The text for household expenditures for Barrow has been revised in the Final Amended IAP/EIS to state that 350 households responded to the survey (85 percent of those receiving surveys). The heading for "Nuiqsut" has been added, and the text for both Barrow and Nuiqsut has been corrected to note that "households" responded to the surveys.

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-135, Subsistence Harvest Patterns, first paragraph: omitted from the description of how listed activities could alter harvest patterns is direct interference with hunts. Most Nuiqsut hunters have experienced the failure of a hunt due to one or more of the listed activities. Game has been disturbed these activities while being approached or actively stalked by subsistence hunters, hunters have found animals far more wary and skittish than normal following disturbance, and hunters have found no game in traditional harvest areas following the presence of vehicles, vessels, and aircraft. ***(Comment No. 196407-099)***

Response To: Comment 196407-099

Changed second sentence of 1st paragraph to "These activities could alter the availability of subsistence species in traditional harvest areas through direct interference with hunts. This direct interference could affect harvest patterns by requiring hunters to travel further because the subsistence resources are more wary and skittish than normal following a disturbance or are deflected from traditional harvest areas following the presence of vehicles, vessels, and aircraft. Nuiqsut residents noted in the Alpine Satellites Development Plan EIS that aircraft have diverted subsistence resources away from areas where hunters were actively pursuing them, directly interfering with harvests or causing harvest to fail (USDOI, BLM 2004:Section 4A, page 632). Increased travel..." Note: text added for oil related activities as well as non-oil in all alternatives (additive for each alternative).

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 4-233, Conclusion: we disagree with the conclusions reached with respect to the potential impact of Alternative B on subsistence species and subsistence harvest patterns. It is misleading to maintain that because most impacts associated with oil and gas exploration and development would be localized, they would not substantially affect subsistence species. If they occur in key habitat areas, like the goose molting and caribou calving, insect relief, and migratory zones that would be newly opened under this alternative, industrial facilities and operations could dramatically impact these populations and subsistence harvests. Moreover, the stipulations and ROPs contained in Alternative B in some cases represent a weakening of the existing 1998 stipulations, and in many cases contain exception clauses that, if utilized, could allow economic and other concerns to take precedence over the protections that are their objectives. The document fails to adequately assess the potential level of impacts to resources, subsistence harvests, and other values that could occur if lessees routinely seek these many possible exceptions and granted by BLM. As written, there are no sideboards placed on the frequency of their use, and no indication that ultimately the granting of exceptions will not become the rule. The paragraph notes that local residents are concerned about the future of subsistence hunting on the North Slope, and our ability to carry on with traditional customs and ways. The rapidity of this proposed amendment so soon after adoption of the 1998 Plan, the weakness of some key analysis in this Draft Plan, and the prevalence of open-ended and easily triggered exception clauses in many proposed mitigation measures validate our concerns.

Page 4-434, Sociocultural Systems: the Draft Plan does not adequately recognize and address the fact that the most likely long-term impacts of an increased industrialization of the NPR-A will be on the human residents of the North Slope, rather than on the wildlife resources of the region. There are numerous studies funded by the petroleum industry and others concluding that many potential impacts to wildlife can be mitigated to varying degrees. We are unaware, however, of any comparable literature finding that an adequate approach to mitigation of impacts on terrestrial subsistence activities has been identified and employed. Some mechanisms for mitigating the effects of offshore impacts appear to have been successful to varying degrees. "Oil-Whaler Agreements" have lessened the impact of seismic and other industry operations on subsistence bowhead whale hunting at Cross Island (NRC, 2003). Simply put, the North Slope experience has been that industrialization of an area results in exclusion of subsistence users from that area. Nuiqsut hunters do not use major portions of their former hunting areas to the east of the village. Another social issue has been well expressed by elder Sarah Kunaknana of Nuiqsut. At several public meetings she has issued a warning to other villages. She urged them not to let the prospect or reality of development create and drive a wedge between factions within their communities as it has at times in Nuiqsut. ***(Comment No.* 196407-105)**

Response To: Comment 196407-105

The text in Conclusion (p. 4-233) was revised to read: "Most impacts associated with oil and gas exploration and development would be localized and would not substantially impact subsistence species if they do not occur in key habitat areas or migratory zones when animals are present. In addition, the ROPs and stipulations discussed above would be protective of subsistence species and could help resolve conflicts between the oil and gas industry and local residents as long as BLM does not overly allow exception clauses. Even in the best case scenario of species protection, however subsistence users would still be constrained by the presence of oil and gas facilities from harvesting subsistence resources, would question the health of those resources, and would tend to harvest resources from five to

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-84: Effects on Subsistence Harvest Patterns. This states that subsistence resources including caribou would avoid areas of oil and gas activity, resulting in long-term localized effects. One needs only to visit the Kuparuk or Prudhoe oil fields to see caribou herds at all-time high levels moving freely throughout the fields to know that this statement is false. It is likely that the Teshekpuk Lake Herd may need a year or more to acclimate and become comfortable with the presence of facilities, but there is no reason to suspect that they would not become as comfortable moving through oil fields as are the Central Arctic and Western Arctic herds today. ***(Comment No.* 196557-081)**

Response To: Comment 196557-081

The EIS cites data collected by NSB and ADF&G regarding avoidance of industrial areas by hunters (e.g., Pedersen). In addition, the EIS relies on Traditional Knowledge regarding the behavior of hunters and caribou around development. Caribou in oil fields are off limits to subsistence hunters due to closed areas (Prudhoe Bay), the proximity of the caribou to the oil and gas infrastructure and resulting avoidance by hunters, security patrols resulting in avoidance by hunters, and pipeline height issues.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

High recruitment rates will be necessary to maintain this level of harvest (Carroll 2002). The sustained balance of harvestable yield could fail due to future environmental stress, including severe weather or industrial development projects (G. Carroll, pers. communication 2002; C. George, NSB Wildlife Dept., pers. communication 2002). ***(Comment No. 197610-045)***

Response To: Comment 197610-045

See response to comment 197610-044 under Caribou - Calving

Comment From: Mark Udall, Congress of the United States (Comment Letter No. 197613)

The Alaskan natives of Nuiqsut and Barrow rely on the caribou from the Teshekpuk Lake herd for their survival. The residents of Nuiqsut already have to travel further and further to find caribou due to the encroaching oil and gas development near their village. The longer they have to travel, the more time they are away from their families and jobs. In addition, they are more exposed to the elements and risk having the meat spoil more quickly. If more development is allowed, these problems will only continue to get worse and further impact the Inupiat way of life. ***(Comment No. 197613-008)***

Response To: Comment 197613-008

This is addressed in the EIS in Sections 4.3.12, 4.4.12, 4.5.12, and 4.6.9.12.

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

It is not only the public's opinion that must be included: so too must scientific research that shows that caribou rely on the Teshekpuk Lake Special Area during calving for the high nutritional value of its vegetation. The Teshekpuk Lake Caribou Herd (TCH) lives in the area and will be adversely impacted if oil and gas exploration are allowed in this area. So, too, will be affected the communities dependent upon them. These communities include Nuiqsut, Barrow, Atqasuk, Wainwright, and Anaktuvuk Pass. Indeed, according to Alaska Department of Fish and Game biologists, North Slope villages harvest between 2500-3000 Teshekpuk caribou per year. This can be compared with an annual harvest of 300-500 caribou of the Arctic caribou herd. Sustaining a harvest of this scale requires a high level of productivity. Any change in that productivity level, whether directly related to industrial complexes in the area, or other industrial encroachments on the calving areas, will significantly impact herd survival, subsistence hunting activities and villages dependent upon the herd. ***(Comment No. 197614-016)***

Response To: Comment 197614-016

See response to comment 197616-139 under Special Designation Areas - Teshekpuk Lake Special Area

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The impacts of leasing additional areas around Teshekpuk Lake and removing the No-Surface Occupancy buffer on our subsistence activities are not considered in the Amended Draft EIS. This is because the Amended Draft EIS

mistakenly says that Nuiqsut's residents do not use the Teshekpuk Lake area for subsistence activities.144 This is inconsistent with Map 3-34145 which shows that we do harvest caribou from all sides of Teshekpuk Lake except the west side. It is also inconsistent with what we and the people of Nuiqsut have periodically told the BLM, which is that the area around Teshekpuk Lake is used by Nuiqsut's residents for subsistence activities, and it is inconsistent with the direct personal knowledge and experience of all the signers of this letter. **(Comment No. 197616-148)**

Response To: Comment 197616-148

The Final IAP/EIS has been revised in consideration of your comments. Added sentence on page J-24 (end of 2nd paragraph) and page 3-83 (end of 2nd to last paragraph): "Nuiqsut hunters use the general vicinity of Teshekpuk Lake to harvest caribou, wolves, and wolverines, (Figures J-9, J-10) and several Nuiqsut families, along with relatives in Barrow and Atqasuk, share use rights to cabins, camps, and allotments in the area and consider it their homeland." On page 4-229 first paragraph under Subsistence Harvest Patterns, edit third sentence to read "Hunters from Nuiqsut, Barrow and Atqasuk would be affected by development…"

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Perhaps, the Amended Draft EIS discounted the importance of the Teshekpuk Lake area to Nuiqsut's hunters because we harvest caribou from this area with less frequency than other areas closer to Nuiqsut.146 But, that is not a reason to drop impacts to Nuiqsut from the analysis. Areas that are used infrequently for subsistence activities can be "important harvest areas when they are used."147 As explained in Nuiqsut Paisanich, A Cultural Plan **(Comment No. 197616-149)**

Response To: Comment 197616-149

See response to comment 197616-148 under Subsistence

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Because of these seasonal and cyclic variations in wild resource patterns (as well as imposed hunting restrictions, Nuiqsut hunters must be flexible. If a primary resource fails, "normal" subsistence rounds may be completely changed, forcing reliance on different geographical areas and animal species. This explains why the hunting landscape must be extensive - in effect, an open range based on biological factors rather than modern land classifications. **(Comment No. 197616-150)**

Response To: Comment 197616-150

The Final IAP/EIS has been revised in consideration of your comments with the following text added to page 3-83 paragraph 5 after sentence "To the south of Nuiqsut…": "West of Nuiqsut are some of the most important remaining subsistence use areas for terrestrial mammals, including caribou, wolf, and wolverine. Nuiqsut hunters travel as far west as Barrow and some reported traveling to within sight of Atqasuk in pursuit of subsistence resources when they are less abundant near Nuiqsut. Travel to the east is undertaken by heading south of the Kuparuk and Meltwater projects by snowmachine, then looping back north to the vicinity of Franklin Bluffs and sometimes beyond. In open water months travel east is by boat along the coast for caribou, seal, eider and sea ducks, and in fall to Cross Island for whaling."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

See appendix J, p. J-33 for a comparison of the percentage caribou harvested by Nuiqsut residents broken down by area. This comparison chart also has a large percentage of caribou harvests falling into the "unknown" category and it is not based on the total harvest numbers for Nuiqsut, and so the relatively low percentage of caribou shown as harvested in the Teshekpuk Lake Area is not definitive. We note that there is not a similar break down for the other communities on the North Slope that also rely on the Teshekpuk Lake area for their caribou harvest. **(Comment No. 197616-151)**

Response To: Comment 197616-151

The Final IAP/EIS has been revised in consideration of your comments with the following text added after the first sentence in last paragraph (p. J-33): "Figure J-9 represents a preliminary analysis of Nuiqsut subsistence harvest location data and not a definitive model of subsistence caribou harvests. Nuiqsut is the only community for which these data were available. Frequency of use and harvest numbers should not be construed as a quantitative measure of value."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

So, it is just plain wrong to say that Nuiqsut's residents harvest few caribou in the Teshekpuk Lake area and so leasing will not impact Nuiqsut's subsistence harvest activities directly. Not only were we incorrectly cut out of the analysis of the impacts that allowing more surface occupancy in the Teshekpuk Lake Special Area would have on subsistence, the analysis of the impacts to subsistence is also deficient. This is because the impacts of roadless development in this area are not analyzed. All that the Amended Draft EIS says is that: [see comment 197616-154] **(Comment No. 197616-153)**

Response To: Comment 197616-153

The Final IAP/EIS has been revised in consideration of your comments with the following text added to p. 4-229 (1st paragraph of Subsistence Harvest Patterns): "Nuiqsut subsistence users have stated during scoping meetings and public testimony that air traffic reduces harvest success. The opening of the areas north and west of Teshekpuk Lake could increase the amount of aircraft disturbance to subsistence species, as compared to the No Action Alternative."

Also see responses to comments 197616-148, -149, -150, -151 under this topic.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Nuiqsut subsistence users have repeatedly stated during scoping meetings that air traffic reduces harvest access and success. The opening of the areas north and west of Teshekpuk Lake could increase the amount of aircraft disturbance to subsistence species, relative to the No Action Alternative. **(Comment No. 197616-154)**

Response To: Comment 197616-154

See response to comment 197616-153 under Subsistence

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The BLM's advances no valid reason for the proposed reversal in the management of the area around Teshekpuk Lake which is not surprising since, as we discussed in section II of this letter, policy, not reason, is driving the BLM to consider additional leasing and to eliminate the No-Surface Occupancy strip in the Teshekpuk Lake Area. We have already explained that satisfying the whims of the current Presidential administration is not a proper basis for the BLM to reverse its current management of the Northeast NPR-A. But, if the BLM insists on proceeding with its plans to amend this management plan, then it must consider the impacts of this change on the TLH and on our subsistence activities in a revised Amended Draft EIS. **(Comment No. 197616-158)**

Response To: Comment 197616-158

In 2002, the President's National Energy Policy Development Group recommended that the President directed the Secretary of the Interior to "consider additional environmentally responsible oil and gas development based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve – Alaska" and that "such consideration should include areas not currently leased within the northeast corner of the National Petroleum Reserve – Alaska." As an agency of the federal government, BLM is responsible for implementing the

President's National Energy Policy to expedite oil and gas leasing and development in northeast National Petroleum Reserve-Alaska, as well as meeting our obligations under federal law. Under the Preferred Alternative in the Draft Amended IAP/EIS, approximately 213,000 acres to the north and northeast of Teshekpuk Lake would remain unavailable for oil and gas leasing. By opening up an additional 387,000 acres under this alternative as compared to the No Action alternative, however, an additional 1.4 billion more barrels of oil would be made available to meet the nation's energy needs if oil prices average $30/bbl. Based on the analysis in the Amended IAP/EIS, the BLM believes that some lands near Teshekpuk Lake that are currently unavailable for oil and gas leasing can be made available for leasing without having a long-term adverse impact on natural and social resources in the region.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The roadless development proposed for the Planning Area would require increased staging and overland travel during the winter, and in summer would require increased use of aircraft for supplies, equipment, and crew changes, as compared to the No Action Alternative. In all seasons, noise, lights, personnel, and traffic near oil and gas-related infrastructure could temporarily deflect or divert caribou in areas where activities are occurring; however, gravel pads could attract caribou during some seasons as insect-relief habitat. These effects could change the distribution, timing, and location of the caribou harvest, which could require increased effort and expenditure on the part of subsistence hunters, resulting in sociocultural consequences such as increased stress and a decreased sense of well being. Increased fuel costs and wear and tear on equipment would increase the need for wage labor to support subsistence pursuits and reduce the time available to pursue these activities, which would also result in sociocultural consequences, such as increased stress and a decreased sense of well-being. Increases in the speed, range, and reliability of outboards and snowmachines have facilitated the mixed subsistence and wage economy, but are unable to compensate for continued development and production activities in important subsistence harvest areas. (Emphasis added.)159 ***(Comment No.* 197616-164)**

See response to comment 197616-163 under Sociocultural Systems

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The quoted text does a little better when it comes to economic consequences. It tells us that we may need to travel farther and at an increased cost in order to harvest caribou, but these are statements of the obvious. It does not tell us how much farther and at what extra cost. Nowhere does the text try to grapple with the differences that would be caused by the lower levels of protection to our lands and subsistence resources that would be afforded by Alternative B and C. ***(Comment No.* 197616-166)**

Response To: Comment 197616-166

Differences caused by lower levels of protection to subsistence resources under Alternatives B and C are addressed in the EIS in the sociocultural and subsistence sections (see sections 4.4.12, 4.4.13, 4.5.12, 4.5.13). The Final IAP/EIS was changed to reflect your comment with additional text added to p. 4-229 3rd paragraph, 4-234 2nd paragraph, 4-310 3rd paragraph, and 4-313 4th paragraph.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

In the Description of the Affected Environment section, the Amended Draft EIS acknowledges that hunters are avoiding areas occupied by oil and gas infrastructure.163 The Amended Draft EIS even attempts to quantify, for the first time that we have seen, the size of the area being avoided. It says that household surveys164 in 1993 and 1994 showed that Nuiqsut residents harvested 0% of their caribou within industrialized areas, 4% of their caribou within 5 miles of industrialized areas, 17% of their caribou 6 to 15 miles from developed areas and 79% of their caribou 16 miles or more distant from developed areas. More recent household surveys were done between June 1999 and May 2000. These indicate that Nuiqsut residents continue to harvest 0% of their caribou within developed areas, the percent of caribou harvested within 5 miles of developed areas had jumped from 4% to 22%, the remaining 78% were harvested more than 5 miles away from development. The jump in the percentage of caribou harvested less than 5 miles away from development is attributed to the construction of the Alpine facilities in the Colville River Delta, an

area where Nuiqsut's residents harvest a substantial number of caribou between June and September.165 The percentage of caribou harvested within 5 to 16 miles of Alpine was 27%. 51% of the caribou were harvested 16 or more miles away from development. **(Comment No. 197616-171)**

Response To: Comment 197616-171

This comment summarizes text in the EIS regarding the use of industrialized area.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

For reasons explained in March 8, 2004 Letter Commenting on the Alpine Satellites Draft EIS, p. 40, household surveys are not the best way to conduct research into the areas where Nuiqsut's residents are harvesting caribou. We continue think that data gathered through surveys will only lead to underestimates of the impacts. **(Comment No. 197616-172)**

Response To: Comment 197616-172

The Final IAP/EIS has been revised in consideration of your comments with the following text added to the end of 3rd paragraph (p. 3-71) and end of 1st paragraph (J-6): "In addition, the reliance on household survey data could result in an underestimation of actual harvests as well as impacts to these harvests. While the data may suggest how wide of an area is being avoided, it does not indicate how Nuiqsut's residents have adjusted or will adjust to Alpine or the other recent development near the village. Also, household surveys may not address people who harvest in all geographic areas. However, household surveys provide the best available data at this time."

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

These surveys have their limitations though, since the "development of Alpine is too recent and there is insufficient data available to conclude whether harvesters will increase their distance from development in response to this relatively new facility."166 Nor were impacts being felt from the development of Meltwater or Tarn, the newest, and now closest developments to the east of Nuiqsut.167 So, while the surveys may shed light on the how wide of an area is being avoided, they do not indicate how Nuiqsut's residents have adjusted to Alpine or the other recent development near the village. **(Comment No. 197616-173)**

Response To: Comment 197616-173

See response to comment 197616-172 under Subsistence

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Unbelievably, these surveys, for what they are worth, were not made a central part of the "analysis" of impacts on subsistence activities in the Amended Draft EIS. Instead, for Alternatives B and C, the Amended Draft EIS only confirms that avoidance is happening and summarizes the avoidance distances noted in 1993-1994 and 1999-2000 surveys.168 This type of uninformative recital isn't analysis that helps the BLM or anyone else understand the likely impacts under the BLM's proposed performance-based mitigation package or the impacts of the different leasing scenarios under Alternatives B or C. Put as many points as there are expected production drill pads under the three alternatives169 anywhere on a map of the Northeast NPR-A and shade in an area 16 miles in any direction from those points, and you begin to see the scope of impacts that we are concerned about. The areas potentially affected are enormous and represent potentially a majority of that portion of our subsistence range that is presently undeveloped. **(Comment No. 197616-174)**

Response To: Comment 197616-174

As this is an EIS addressing rules change and does not propose an actual development/construction project, and

development is already proposed for critical Nuiqsut subsistence use areas under the existing rules (e.g., ASDP), it would not be appropriate, or feasible, to use the Pedersen survey data in the effects discussion for alternatives B and C except in general terms. However, it would be fair to include this data in the cumulative effects discussion by including text on p. 4-402 (end of 1st paragraph) that states that "If permanent development occurs in areas newly opened to exploration and leasing under Alternatives B and C, and one were to put as many points as there are expected production drill pads under the three alternatives anywhere on a map of the Northeast National Petroleum Reserve-Alaska and shade in an area 16 miles in any direction from those points, the areas that would be potentially affected would be enormous and represent potentially a majority of that portion of the subsistence range that is presently undeveloped."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Page 6, Summary of Impacts: The last paragraph should acknowledge that subsistence users may be displaced even if the availability and distribution of subsistence resources do not change substantially. Subsistence hunters from Nuiqsut no longer hunt in traditional areas where oil-field infrastructure now exists, even though in some instances subsistence resources continue to be available. Additionally, it should be noted that if caribou are displaced, particularly from the TLH, the community of Wainwright would also be affected because the majority of caribou it harvests are from the TLH. ***(Comment No. 197618-013)***

Response To: Comment 197618-013

Changed text to read: "The communities of Anaktuvuk Pass, Atqasuk, Barrow, and Nuiqsut would be most affected; the community of Wainwright could also be affected, since the majority of the caribou it harvests are from the TLH. Caribou could become unavailable, undesirable for use, or experience long-term population and productivity effects for a period longer than 5 years. These effects could disrupt sociocultural systems in the communities that are reliant on caribou for subsistence. Subsistence users could also be displaced even if the availability and distribution of subsistence resources did not change substantially. For example, Nuiqsut subsistence hunters no longer hunt in traditional areas

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

J.7, Page J-8, Contemporary Subsistence Uses: This and the following sections should acknowledge the importance of migratory birds from the project area to Native peoples in western, southwestern and interior Alaska. ***(Comment No. 197618-116)***

Response To: Comment 197618-116

Add sentence (end of 2nd paragraph p. J-6) "Migratory birds from the project area are important to Native peoples in western, southwestern, interior Alaska, and along the Pacific Flyway."

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Subsistence is given special consideration in determining the requirements for, and evaluation of, disproportionate impacts. EPA believes that opening additional lands and removing surface activity restriction in the Teshekpuk Lake area and along the coast would cause adverse impact to subsistence resources that would likely result in high, disproportionate impacts on subsistence users in North Slope communities. We are particularly concerned that disturbance to bowhead whales, goose nesting and molting habitat, caribou calving grounds, insect-relief area and migration corridors and the displacement of caribou could result in long-term adverse impacts to subsistence lifestyle in North Slope communities. The proposed performance-based stipulation and ROPs that are included in the Preferred Alternative do not ensure adequate protections or mitigation for subsistence resources that are used by North Slope residents. ***(Comment No. 197632-037)***

Response To: Comment 197632-037

Oil and gas exploration and development in the Planning Area would impact subsistence resources and lifestyles, as discussed in Chapter 4 of the Amended IAP/EIS. The "K" lease stipulations specifically apply to biologically sensitive resources in the Planning Area. Stipulations K-3 through K-8, in particular, would ensure that exploration and development do not conflict with traditional subsistence users and would help to minimize impacts to subsistence resources. To further ensure that affected communities are consulted before an oil and gas-related activity occurs in the Planning Area, ROPs H-1 and H-2 require the applicant to consult directly with affected communities and make every reasonable effort to ensure that proposed activities would not result in unreasonable interference with subsistence activities, before submitting an application.

Comment From: Rosemary Ahtuangaruak (Comment Letter No. 197976)

Offshore development has impacted our whaling. We had seismic activity in Camden Bay that caused us to lose two whaling boats. We did not harvest whale two seasons in a row. We went without whale those winters. Those were the deepest, darkest winters I faced as a community health aide. We saw an increase to the social ills, we saw domestic violence, we saw drug and alcohol abuse, we saw all the bad things that come when we are not able to maintain our traditional life activities. We want to be able to continue our daily life activities in spite of the activities that occur around us. If we are able to maintain our daily life activities, we are able to continue being who and what we are, and we're able to continue our lives in the means that our elders have taught us to sustain our lives for the centuries before us. ***(Comment No.* 197976-140)**

This agency is committed to protecting the resources that provide subsistence to the people that reside on the North Slope. We intend to continue to consult with the North Slope communities on land use management decisions in the Nation Petroleum Reserve-Alaska. We also believe that the Final Preferred Alternative D will provide the necessary protections to subsistence resources while providing access for oil and gas activities in the planning area.

Comment From: Rosemary Ahtuangaruak (Comment Letter No. 197976)

Fishing was devastated for eight years. The Arctic cisco is a staple that we depend on when we don't have the whale. We want to be able to continue. With caribou, when Alpine opened, we went from 97 to three houses harvesting caribou. Those are serious impacts that our people went without our serv- -- without our traditional foods. We didn't get any help from anything. We went without our foods. I know you all think you can get jobs and provide for your families, but you're taking food off of our tables. Thank you. ***(Comment No.* 197976-145)**

Response To: Comment 197976-145

The TLH have been know to move great distances but have maintained their presence in the Teshekpuk lake area. Seismic exploration has occurred in the NPRA for a number of years not just last year.

Comment From: Charles Brower (Comment Letter No. 197980)

The subsistence users themselves must confirm any new subsistence information. If BLM has new information relating to subsistence species or uses in the Planning Area, that information should be shared, discussed, analyzed and corroborated with the affected North Slope communities as was done in a subsistence workshop during preparation of the 1998 EIS. ***(Comment No.* 197980-022)**

Response To: Comment 197980-022

Under the Final Preferred Alternative ROPs H-1 and H-2 and lease stipulation K-6 require the lessee/permittee to consult on all aspects of activity within the Northeast Planning Area before any on-the-ground activity occurs. Please see those stipulations for a complete description of the mitigation measure.

Comment From: Arnold Brower Jr. (Comment Letter No. 197988)

The (indiscernible) Lakes, Pik Dunes, and those hills, we call them the Blue Hills up past the Kogohokruk River, are our prime areas that our young men go for wolverine, wolf hunting and trapping. And this is there for our traditional clothing, for our -- because this sustains our natural warmth in our body, when we have our traditional clothing. So it's for our tradition and culture. We do not want to -- if those become restricted and -- you know, we will lose our traditional way of life. You know, you start to make -- knit a sweater and you loosen one -- and now you're pulling it out from the seams. And now it's -- you know, we can't be bare naked in the Arctic Slope. **(Comment No. 197988-201)**

Response To: Comment 197988-201

The Pik Dunes are subject to protective stipulations and ROPs under all alternatives.

Comment From: Geoff Carroll (Comment Letter No. 197988)

And just one more note on -- I noticed on page B-13 it states that: Teshekpuk caribou herd is a primary source of caribou for Anaktuvuk Pass. And it also mentions Barrow and Atqasuk, I believe. The fact is that the Teshekpuk herd really is not a primary source for Anaktuvuk Pass, the Western Arctic caribou herd is. However, the Teshekpuk herd is the primary source for Wainwright, which is not included in that list. **(Comment No. 197988-224)**

Response To: Comment 197988-224

Wainwright has been included.

TOPIC: TERRESTRIAL MAMMALS

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 2-81 thru 2-82, Effects on Terrestrial Mammals: the table entries fail to characterize, either quantitatively or qualitatively, the potential effects of the alternatives on caribou and other terrestrial mammals. The table only states the obvious, i.e., that effects would occur over a greater area under Alternative B versus Alternative A, and a greater area still under Alternative C. Under both Alternative B and C, it is further explained that lease stipulations and ROPs "would help minimize impacts". Here, as in the table entries under birds, a worrisome conclusion regarding potential cumulative effects is stated, but then downplayed by meaningless estimates of the small percentage of overall habitat subject to disturbance. **(Comment No. 196407-081)**

Response To: Comment 196407-081

The text has been revised in Table 2-3, Terrestrial Mammals, to better describe the types and magnitude of impacts that could occur to terrestrial mammals under each alternative. This statement has been revised to note that although approximately 1% of the North Slope could be directly impacted by oil and gas development, but that activities in the Planning Area could affect proportionally more mammals if areas of high importance to terrestrial mammals are impacted.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative A, Section 4.3.9.1, Terrestrial Mammals, Effects of Disturbances, Pane 4-1 09. The last paragraph of Exploratory Drilling notes that there would be a greater potential for grizzly bears and foxes to be attracted or habituated to camps associated with drill sites. However, during winter, when exploratory drilling is occurring, grizzly bears would be in hibernation and would not be attracted to these camps. **(Comment No. 197620-081)**

Response To: Comment 197620-081

The Final IAP/EIS has been revised in consideration of your comments. Grizzly bears were removed from this statement in Section 4.3.9.1, Terrestrial Mammals, Effects of Disturbances, Exploratory Drilling, as the comment states polar bears would be in hibernation during the time drilling activities would be conducted.

TOPIC: TESHEKPUK LAKE

Comment From: patriotic US citizen (Comment Letter No. 149424)

TESHEKPUK LAKE: NO EQUAL ON THE PLANET Scientists rate Teshekpuk Lake area as one of the most important Tundra-Wetland ecosystems remaining in the world. It comprises coastal LAGOONS, deepwater LAKES, sedge grass MEADOWS and braided RIVERS and STREAMS. This habitat provides critical calving grounds for the 45,000-strong Teshekpuk Lake CARIBOU herd. POLAR BEARS find a place here, too, wandering the coastal areas of the Lake in the warmer months. So do people. **(Comment No. 149424-007)**

Response To: Comment 149424-007

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Teshekpuk is the third largest lake in Alaska; however, very little scientific information about the Lake or its fishery resources is available, as studies have been few and infrequent (Bendock and Burr, 1984; Philo et al., 1993). Leasing of the Lake must not even be considered until the fish biology of this huge water body is better understood. Likewise, drilling within the Lake basin must be prohibited and not considered until the physical and biological properties of the Lake are well understood. Any major release of oil into Teshekpuk Lake or connected water bodies would significantly affect the region's fish resources, as well as devastate large concentrations of waterfowl, and impact the subsistence harvests of several communities. **(Comment No. 196407-033)**

Response To: Comment 196407-033

Teshekpuk Lake, under the Proposed Action (Alternative D), has been deferred from oil and gas leasing.

Comment From: Ben Long (Comment Letter No. 196948)

The Teshekpuk Lake is ecologically unique and one of the most critical habitats for wildlife in the Arctic. I urge you to keep the original size of the Teshekpuk Lake Surface Protection area, i.e., 857,859 acres, intact. **(Comment No. 196948-004)**

Response To: Comment 196948-004

See response to comment 186677-007 under Alternatives, Range of Alternatives, Preferred Alternatives

Comment From: Northern Alaska Environmental Center (Comment Letter No. 197614)

It is unclear what new scientific evidence has been produced that will show how development can occur around Teshekpuk Lake without seriously harming wildlife and subsistence use. Such evidence should be included in detail in the SEIS. **(Comment No. 197614-019)**

Response To: Comment 197614-019

There are numerous studies detailed in the IAP/EIS that indicate that development can occur in tundra ecosystems with negligible to minor impacts. Other studies indicate moderate impacts and still others show fairly significant impacts. BLM has designed stipulations and ROPs to prevent or mitigate impacts they feel would be too great.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

This isn't just impacts to the uplands that we are talking about. Alternatives B and C would allow leasing and ultimately development in the waters of Teshekpuk Lake. This represents yet another reversal of the protections provided in the 1998 NE NPR-A ROD. Even the Amended Draft EIS says that allowing drilling in or near Teshekpuk Lake "is less protective of water resources" than the 1998 NE NPR-A ROD because of the risk of an oil spill in the lake is greatly increased. Greatly increased risk of an oil spill reaching the lake, that doesn't sound like maximum protection to us. We are concerned that exploration and development in Teshekpuk Lake will have impacts that are not discussed in the Amended Draft EIS. Would the development of a field in Teshekpuk Lake happen from platforms or bottom founded gravel structures? How would exploratory drilling take place? From the ice? Has that been done before in a confined freshwater lake? What about impacts on the use of the concentration of cabins and campsites that are located all along the shore of Teshekpuk Lake? **(Comment No. 197616-136)**

Response To: Comment 197616-136

Teshekpuk Lake, under the final Proposed Action (Alternative D), has been deferred from oil and gas leasing.

Comment From: State of Alaska (Comment Letter No. 197620)

Teshekpuk Lake. Under the preferred alternative and Alternative C, Teshekpuk Lake would be available to leasing and subsequent exploration and development drilling. As a consequence, drilling islands and cause ways into Teshekpuk Lake are a likely possibility if exploration drilling discovers commercial quantities of oil beneath the lake. There should be a thorough discussion regarding the potential effects of construction, operation, and maintenance of drilling islands and cause ways on water resources, water quality, fish, birds, and mammals. **(Comment No. 197620-032)**

Response To: Comment 197620-032

The BLM discourages the use of solid-fill causeways and there is a general prohibition on the construction of causeways, docks, gravel islands, and bottom-founded structures under all of the alternatives. However, the AO in consultation with appropriate Federal, State, and NSB regulatory and resource agencies has the right to consider construction of such facilities in light of potential damage to fish and fish communities. Environmental studies might be required. Such assessments would be done on a case-by-case basis and it impossible to discuss the impacts of any construction generically. Where is the structure located? How long is it? How much bottom area does it cover? Such considerations are beyond the scope of a general environmental assessment.

Comment From: P. Matthew Shudtz (Comment Letter No. 197637)

As noted in the Draft Amended IAP/EIS, "(t)he water flow patterns in this extraordinary flat landscape are complex, and the outlets and inlets can reverse flow, depending on lake levels and stream flows." The exploration activities that would be allowed under Alternative B have the potential to significantly affect both lake levels and stream flows at Teshekpuk Lake, which would harm this ecologically important area. **(Comment No. 197637-004)**

Response To: Comment 197637-004

As discussed in Chapter 4 under Water Resources, exploration activities have the potential to impact lake levels and stream flows due to construction of ice roads and pads, and in some cases, permanent facilities. To reduce these impacts, the BLM has identified several ROPs and lease stipulations that are directed toward maintaining natural

spring runoff patters (ROP C-3), minimizing travel up and down streambeds (ROP C-4), prohibiting exploratory drilling in most rivers and streams (Lease stipulation D-1), and limiting exploratory drilling to temporary facilities such as ice pads and roads, where possible (Lease stipulation D-2). In addition, lease stipulations have been developed to minimize the disruption of natural flow patterns and changes to water quality in deep water lakes, including Teshekpuk Lake (Lease stipulation K-2).

TOPIC: THREATENED AND ENDANGERED SPECIES

Comment From: Kay Woods (Comment Letter No. 183937)

The Teshekpuk Lake region of America's Western Arctic with its vast network of coastal lagoons to deep lakes, wet sedge grass meadows and numerous river deltas, the area is prime habitat for caribou, lemmings, snowy owls, Arctic fox and the spectacled eider, a threatened sea duck must be protected from oil and/or gas exploration and drilling. ***(Comment No.* 183937-002)**

Response To: Comment 183937-002

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas unimportant to species of concern.

Comment From: Mary Hogan (Comment Letter No. 194604)

The Teshekpuk Lake area is also important to many other bird species, including spectacled eiders, a threatened species under the Endangered Species Act. No matter what mitigated measures are put in place, oil and gas development will affect nesting habitat and species will suffer from both disturbance and the increased numbers of predators that follow oilfield development. In addition, the 45,000 Teshekpuk Lake Caribou Herd uses this area to seek relief from insects and is an important subsistence source to North Slope hunters. BLM should consider the effects of jeopardizing this habitat for caribou by opening it to leasing. ***(Comment No.* 194604-005)**

Response To: Comment 194604-005

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of threatened eiders to the potential impacts of oil development. Specific regulations have been established to reduce the potential for increased predation levels due to predator attraction to developed areas. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Aaron Wernham (Comment Letter No. 195986)

Teshekpuk lake is a critical wildlife habitat for many migratory waterfowl, including the endangered Spectacled Eider. Under the "preferred alternative" impacts to eiders "would be about twice as great for oil and gas exploration activities, and four times as great for oil development activities, as compared to the No Action Alternative." Given that eiders are endangered, it must be acknowledged that a decision to explore an area of heavy eider nesting means gambling with possible extinction of this species. ***(Comment No.* 195986-001)**

Response To: Comment 195986-001

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese to the potential impacts of oil development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern. It is likely that areas used by spectacled eiders will be identified prior to development.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The spectacled eider is a pelagic sea duck that was listed as threatened under the US Endangered Species Act in May 1993 (USFWS 1996). Ongoing surveys indicate that the North Slope component of the species numbers about 7,000 birds in recent years (Larned et al. 2003) with most breeding in the NPR-A. **(Comment No. 197610-084)**

Response To: Comment 197610-084

This information can be found in the EIS in Section 3.3.8.2 Spectacled Eider, Population Status.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

A high-density spectacled eider nesting area occurs northeast of Teshekpuk Lake (USFWS, Eider Breeding Population Survey Arctic Coastal Plain Alaska, 1998-2001) (see map in Audubon Alaska 2002). Nesting success varies substantially by area and year (Petersen et al. 2000). Predator numbers may increase in areas of industrial development because of the availability of garbage. Predators include Arctic fox, gulls, jaegers, and ravens (USFWS 1996, Petersen et al. 2000). Increasing predator numbers may reduce the productivity of nesting eider in and around development sites (Martin 1997, Day 1998). **(Comment No. 197610-085)**

Response To: Comment 197610-085

The TLSA is an important area for spectacled eiders. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of eiders to the potential impacts of oil development. Specific regulations have been established to reduce the potential for increased predation levels due to predator attraction to developed areas. Some predators such as jaegers are likely not attracted to development. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The Alaska breeding population of Steller's eider is listed as threatened under the US Endangered Species Act. Three breeding populations are recognized worldwide (US Fish and Wildlife Service [USFWS] 2002). A small breeding population on the Arctic Alaska coastal plain, primarily in NPR-A, is the last in North America (USFWS 2000, Fredrickson 2001). **(Comment No. 197610-088)**

Response To: Comment 197610-088

This information can be found in Section 3.3.8.3 Steller's Eider of the EIS.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The breeding population of Steller's eiders in Northeast NPR-A could be vulnerable to habitat loss caused by expanded resource development in the TLSPA. Nest placement data suggest no attraction to, nor avoidance of, manmade structures; however, most Steller's eider nests are greater than 1,640 ft from roads (Obritschkewitsch et al. 2001). **(Comment No. 197610-089)**

Response To: Comment 197610-089

Steller's eiders are very uncommon in the Planning Area. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of eiders to the potential impacts of oil development. Specific regulations have been established to reduce the potential for increased predation levels due to predator attraction to developed areas. In addition it is likely that pre-development studies will identify

areas that may require special protection or areas important to species of concern.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Industrial development in breeding habitats may result in wetland loss or changes due to drainage, impoundment, changes in permafrost, or disturbance (BP 2001, Balogh, personal communication 2002). One area of relatively high nesting density west of Teshekpuk Lake is already leased while the highest density nesting habitat occurs in the Teshekpuk Lake Surface Protection Area currently unavailable for leasing (Bureau of Land Management [BLM] 1998). We are unaware of new scientific studies that suggest leasing could occur in this area without placing waterbirds, including spectacled eiders, at risk. ***(Comment No. 197617-136)***

Response To: Comment 197617-136

The TLSA is an important area for spectacled eiders. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of eiders to the potential impacts of oil development. There is evidence to suggest that in some cases habitat changes such as the formation of impoundments may provide additional habitat for spectacled eiders. These studies are cited in the EIS. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Steller's Eider: The Alaska breeding population of Steller's eider is listed as threatened under the U.S. Endangered Species Act. Three breeding populations are recognized worldwide (U.S. Fish and Wildlife Service [USFWS] 2002). A small breeding population on the Arctic Alaska coastal plain, primarily in NPR-A, is the last in North America (USFWS 2000, Fredrickson 2001).The breeding population of Steller's eiders in the northeastern NPRA could be vulnerable to habitat loss caused by expanded resource development in the Teshekpuk Lake Surface Protection Area. Nest placement data suggest no attraction to, nor avoidance of, manmade structures; however, most Steller's eider nests are greater than 1,640 ft (500 m) from roads (Obritschkewitsch et al. 2001). Furthermore, predation was the major cause of nest failure near Barrow (1997-2000), and high nest-failure rates may contribute to population decline and inhibit recovery (Obritschkewitsch et al. 2001). Increased predator numbers and predation is a recognized byproduct of oil exploration and development and may affect Steller's eiders where there is contact with oil fields (Martin 1997, Day 1998). ***(Comment No. 197617-137)***

Response To: Comment 197617-137

Steller's eiders are very uncommon in the TLSA. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of eiders to the potential impacts of oil development. Specific regulations have been established to reduce the potential for increased predation levels due to predator attraction to developed areas. Should development occur in the TLSA there will likely be numerous areas located further than 500 m from roads. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Environmental Coalition (Comment Letter No. 197617)

B. PROPOSED ACTION THREATENS BOWHEAD WHALES The Bowhead whale was listed as endangered under the Endangered Species Conservation Act, the predecessor to the ESA, on June 2, 1970 (35 FR 84495). The species was then listed as endangered under the ESA in 1973. The DEIS recognizes that bowhead whales may be present in the Beaufort Sea, offshore of the northern planning area. Bowheads use portions of the Beaufort Sea for calving, migration, and feeding. The Bowhead's westward fall migration takes them through these waters from August to October. Their spring migration takes them through the western planning area from April to early June. During both the fall and spring migrations, it is well documented that normal behavior patterns are disrupted by industrial activity. Disruptions in feeding, socializing, sexual behavior, communication, and cow/calf interactions have all been documented during these times. The long-term effects of these disturbances and injuries are unknown. In the fall, any

disruption of feeding could be particularly harmful to the bowhead in meeting its energetic requirements for the winter. Disruption of migration in the fall could also be disastrous if bowheads were delayed or blocked from reaching their wintering grounds on the Bering Sea before freeze-up. **(Comment No. 197617-138)**

Response To: Comment 197617-138

See appropriate sections of Chapter 4 for discussions of impacts to bowhead whales.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

Additionally, recent telemetry studies showed that a significant number of male spectacled eiders use overland routes during westward molt migration across the Arctic Coastal Plain (Troy 2003). Migrants are likely more vulnerable to collisions with wires than resident breeding birds (Stout and Cornwell 1976), so limiting this measure to known breeding habitat places migrants at risk of take wherever breeding pairs are not detected. Moreover, other migratory birds may be equally vulnerable to collision with overhead wires, and take of these species is prohibited under the Migratory Bird Treaty Act. Finally, collision is not the only potential impact of overhead wires; birds, particularly raptors, may be electrocuted, and perhaps more importantly, support structures for overhead wires provide perches for predators in areas where perches are otherwise rare or absent. This could expand the foraging range of predators and have substantial impacts on avian prey well beyond the immediate area of the structures. **(Comment No. 197618-026)**

Response To: Comment 197618-026

We have revised the language to include all eiders.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.3.10.2, Page 4- 130, Effects of Spills, Spectacled and Steller's Eiders, Paragraph 2, Sentence 3 : It is not necessarily true that an offshore spill in summer would have a greater effect on threatened eiders than a winter spill. A winter spill may not be cleaned up until well after spring breakup. If floating oil was present during the spring broken ice period, migrating eiders would be oiled when landing in contaminated leads. **(Comment No. 197618-075)**

Response To: Comment 197618-075

This issue is addressed in the last sentence of the cited paragraph. Some additions were made to clarify the potential for oil to accumulate in leads.

Comment From: State of Alaska (Comment Letter No. 197620)

Steller's and Spectacled Eiders A separate analysis of impacts within Environmental Consequences should be developed for spectacled and Steller's eiders. Given the rather restricted distribution of Steller's eiders, and the - more widespread distribution of spectacled eiders, the relative impacts of a specific activity to each of the species should differ. Providing separate analyses for each species should give a more clear assessment of the potential impacts to each species. **(Comment No. 197620-044)**

Response To: Comment 197620-044

Because so few Steller's eiders are likely to occur in the Planning Area the two species were combined into one section. A more thorough discussion of the two species can be found in the Biological Assessment contained in Volume 2 of the EIS.

Comment From: State of Alaska (Comment Letter No. 197620)

Map 3-26. Onshore Density of Spectacled Eiders. Same comments as Map 3-10. **(Comment No. 197620-068)**

Response To: Comment 197620-068

Actual numerical densities were not provided by our cited source.

Comment From: State of Alaska (Comment Letter No. 197620)

Appendix G, BLM Sensitive Species List for Alaska. Throughout the document, this BLM sensitive species list is identified as "proposed." However, the appendix does not indicate that this list is a proposed list. Either the text references or the appendix should be altered to reflect the true status of this list. **(Comment No. 197620-102)**

Response To: Comment 197620-102

The BLM Sensitive Species List for Alaska is final.

TOPIC: THREATENED AND ENDANGERED SPECIES

ISSUE: BIOLOGICAL ASSESSMENT

Comment From: Environmental Coalition (Comment Letter No. 197617)

BIOLOGICAL ASSESSMENT IS FUNDAMENTALLY FLAWED The agency's reliance on a hypothetical scenario for the Biological Assessment in the draft IAP/EIS violates the ESA requirement to consider the entire agency action. The Biological Assessment must be coextensive with the agency action. When the action is the sale of an oil and gas lease, the scope of the action includes all activities that result from leasing. In addition the draft IAP/EIS does not meet the requirements under the ESA because the impacts analysis is flawed. Not only does the proposed action authorize development beyond the hypothetical scenario, such development also poses series threats to eiders. **(Comment No. 197617-142)**

Response To: Comment 197617-142

The BLM's use of the reasonable and foreseeable development scenario does not limit the analysis, it simply allows the BLM to realistically narrow the uncertainty inherent in analyzing a multistage action when the specific location and scope of the potential future actions are unknown. Use of the scenario allowed the BLM to display and analyze the direct, indirect and cumulative effects of the future activities and prepare a comprehensive BA for the entire action.

There is inherent uncertainty in how where and how much development could occur as the result of oil and gas leasing. When this level of uncertainty exists the BLM must make projections regarding development and use those projections to asses the potential impacts on listed species or their critical habitat. BLM used a conservative reasonable and foreseeable oil development scenario to define the probable location and scope of subsequent development. BLM based the development scenario and the associated explicit assumptions on their and supporting agencies technical expertise and recent experiences on the North Slope.

Thus the BLM development scenario is a reasonable projection of potential impacts that could result in adverse affects on listed eiders from post leasing activity. Further the BLM used the high spectacled eider densities and Steller's eider densities higher than recorded in the Planning area to base the Biological Assessment. This approach allowed the BLM to provides a realistic projection of maximum amount of development and the maximum expected impacts to eiders. In addition, the IAP/EIS includes a set of ROPs and Stipulations to mitigate potential adverse impacts no matter where development occurs.

Finally as the development scenario is based on a specific set of assumptions, if a subsequent proposed development violates those assumptions, BLM would be required to reinitiate consultation with the U.S. Fish and Wildlife Service

Comment From: Environmental Coalition (Comment Letter No. 197617)

Indeed, the Biological Assessment concedes that the agencies do not have adequate population data and site data on Steller's eiders, stating: This eider population survey has been conducted annually since 1992, and has provided data to develop a population index and distributional information for several species, including spectacled eiders. Given that Steller's eiders are present on the ACP in very low densities, the eider population survey's sampling intensity is inadequate for obtaining data to develop a population index for this species (Larned et al. 2003). Quakenbush et al. (2002) has suggested that the range of the Steller's eider in Alaska has been greatly reduced, mostly in the vicinity of Barrow. In 1999, a survey specifically designed to obtain information on Steller's eiders in the Barrow area was initiated (Ritchie and King 2004). The survey area, which is referred to as the "Barrow Triangle," encompasses a 1,064-mi2 (2,757-km2) area south of Barrow and west of Admiralty Bay (see Ritchie and King 2004 for a complete description of the study area and slight differences among years). This survey has provided densities and population estimates of Steller's eiders in the Barrow area for the past 5 years. In order to be as conservative as possible with respect to Steller's eiders, we choose to use densities generated by the "Barrow Triangle" survey, as they are likely to be the greatest densities of Steller's eiders present on the ACP. For this analysis we used a mid-level Steller's eider density of 0.16 observed birds per mi2 (0.06 observed birds per km2; Ritchie and King 2004), since high densities of Steller's eiders have not been found anywhere in the Planning Area. A visibility correction factor has not been applied to this density estimate. Biological Assessment at D-7 (emphasis added). The two italicized statements in the quote above are inconsistent. On one hand the Biological Assessment concedes that the sampling intensity is inadequate to develop a population index for the Steller's eider, but then other the other hand the Biological Assessment claims that high densities have not been found in the Planning Area. If the sampling intensity is inadequate, how can the Biological Assessment make the second claim without qualification? Indeed, since "high densities" is not defined, it is difficult to know what the statement means. Under NEPA the lack of reliable population and site data triggers 40 C.F.R. § 1502.22's requirement that the agencies get the data or explain adequately why getting the data is not possible. This also applies to the lack of empirical data supporting an important assumption BLM makes in the Biological Assessment and elsewhere in the draft IAP/EIS about the "zone influence" from oil and gas facilities on eiders: ***(Comment No. 197617-143)***

Response To: Comment 197617-143

Steller's eider densities are apparently greater in the "Barrow triangle" than in other areas on the National Petroleum Reserve-Alaska. Steller's eider densities are probably much lower in the NE National Petroleum Reserve-Alaska than in the "Barrow triangle." To take a conservative approach in the analysis of impacts we used densities that we considered to be higher than those that might actually occur in the Planning area. In this way we felt that we would not underestimate the number of Steller's eiders that may be affected by development.

Comment From: Environmental Coalition (Comment Letter No. 197617)

To address disturbance effects to eiders, in addition to the immediate habitat loss from gravel pad and road development, the BLM is assuming both a 656-foot (200-meter) and a 1,640-foot (500-meter) zone influence around all gravel production and development pads and roads. The 656-foot (200-meter) zone influence has been used in previous analysis by USFWS, but is based on best professional judgment and little empirical data supports its use. The additional 1,640-foot (500-meter) zone of influence will allow for determination of the maximum number of eiders that potentially could be affected by production facilities. Biological Assessment at D-7 (emphasis added). ***(Comment No. 197617-144)***

Response To: Comment 197617-144

That is why the 500 meter buffer was added.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The Biological Assessment fails to explain how BLM could legally allow "the areas ... [to] be available to rural subsistence users" but not to "the general public." Biological Assessment at D-15. The increase in access by the

general public could obviously cause impacts to eiders. See id. at D-28-29 (discussing eider reaction to foot traffic). ***(Comment No.*** **197617-148)**

Response To: Comment 197617-148

Roads constructed for industrial use do not have to be opened to the general public.

TOPIC: TIMING

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The NSB supports oil exploration and development in the NPR-A that maintains healthy wildlife populations and protects subsistence opportunities. But a responsible balance must be struck between the protection of critical areas and development. Approaching a consensus position on the proposed amendment has presented a difficult challenge for the Borough , other North Slope entities and our residents. We faced these same questions in 1997 and 1998, but clearly, the stakes are higher now. Given the importance and complexity of the management decisions now before us, there simply has not been enough time for necessary discussion among either our affected communities and groups, or among the people of the North Slope and the BLM, other involved federal and state agencies, the oil and gas industry, and outside parties with a stake in the process. This has been particularly frustrating because we have been clear since the beginning and throughout this process that appropriate time must be provided to do the job right, and because to a large extent other substantial BLM and Interior Department planning efforts (Northwest NPR-A, Alpine Satellite Development Project, OCS Lease Sales 186 and 195) have competed for our attention and resources. Accordingly, we have adopted a position that likely does not reflect the best effort and analysis that would have been possible with sufficient time to engage all stakeholders in a meaningful dialogue. ***(Comment No.*** **196407-001)**

Response To: Comment 196407-001

BLM has tried very hard to reach out to affected communities and North Slope Residents to address our shared concerns (see Chapter 5).

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

As we see it, there are two possible solutions to schedule-driven problems with this review. The BLM could further ***(Comment No.*** **196407-002)**

Response To: Comment 196407-002

BLM extended both the scoping and the Draft comment periods for the Northeast amendment. Also, in addition to public meetings held in all affected North Slope communities during the Draft comment period, the BLM held separate ANILCA 810 meetings in Barrow, Anaktuvuk Pass, Nuiqsut and Atqasuk after the close of the Draft comment period in an attempt to fully engage the North Slope community in this planning effort (also see Chapter 5

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

The BLM and others may respond that a demand for substantially more time is unreasonable, and that a "typical" management plan or EIS is developed in less time. We cannot say whether that is the case, but suggest to you that the circumstances surrounding this planning effort are in no way "typical". First, we as Inupiat people are going to be more directly and intimately affected by the decisions the BLM makes than "typical" stakeholders elsewhere because our relationship to the land at issue here is more direct and intimate. That is why the law requires that special focus be given to the potential subsistence impacts of federal actions. Second, most of us who have an interest in this review, as well as being subsistence users who participate in a mixed subsistence/cash economy, already have precious little time to engage in it. We have what for anyone else would be two full-time jobs: A cash day job, and the complex, time-consuming, and culturally significant job of subsistence. Here again, as a federal agency, attention to the special

circumstances of subsistence users is required to be a component of your environmental justice analysis. We will discuss further on in our comments the environmental justice implications of failure to provide adequate time for our Inupiat residents to fully participate in this review, and to fully address key subsistence questions in the draft plan. ***(Comment No. 196407-003)***

Response To: Comment 196407-003

See response to comment 196407-002 under topic Timing.

Comment From: Alaska Eskimo Whaling Commission (Comment Letter No. 197605)

A decision to open the Northeast National Petroleum Reserve - Alaska (NPRA) to additional leasing would be unreasonably premature at this time. The Bureau of Land Management (BLM) and its NPRA stakeholders have not had the opportunity to develop, implement, and evaluate the effectiveness of the mitigation measures developed in 1998 to support the extensive leasing plan developed for the Northeast NPRA at that time. ***(Comment No. 197605-003)***

Response To: Comment 197605-003

As an agency of the federal government, BLM is responsible for implementing the President's National Energy Policy to expedite oil and gas leasing and development. In accordance with the President's energy policy, BLM has initiated this NEPA process as we consider making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing. Subsequent to the 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS, the analyses in the 2003 Northwest National Petroleum Reserve IAP/EIS and the 2004 EIS on the Alpine Satellite Development Plan indicate that oil and gas leasing, exploration, development, and production activities with appropriate mitigation measures can occur in the National Petroleum Reserve-Alaska without significant impacts to wildlife. In consideration of recent operational experiences in the National Petroleum Reserve-Alaska and the analysis of the performance-based measures in the Northwest Petroleum Reserve IAP/EIS, BLM believes it is an appropriate time to reconsider the stipulations and ROPs in the National Petroleum Reserve-Alaska and has made a decision to study and consider such a change via this NEPA process.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The extent and scope of the administrative processes which the Bush administration has unleashed on the people of the North Slope and Nuiqsut in particular over the past two years could hardly have been better designed if its intent had been to stifle and diffuse effective comment by the Inupiat people of Nuiqsut and the North Slope. Not only has there been the lengthy and complex EIS proceedings for the Northwest NPR-A and this process for amending the applicable management practices for the Northeast NPR-A, but we have also been faced with an EIS for the Alpine Satellites which we and most of the reviewing agencies, including EPA under its Clean Water Act rating system, considered seriously and extensively inadequate. All three of these agency actions seriously impact or threaten the community of Nuiqsut and our culture and way of life. Between these three EIS documents, we have had to review and comment on well over 5,000 pages of complex, difficult materials, which does not even count the additional materials involved in multiple drafts or the effort involved in scoping and public hearings. The shifting justifications in the amendment process here and the sheer volume of materials thrown at our people, for many of whom English is not their native tongue, denies us and other Inupiats on the North Slope the fair treatment and meaningful involvement that environmental justice requires. EO 12898. Nor has consultation been particularly useful in light of the hollowness of the reasons for amending the NE NPR-A EIS/IAP and ROD that were discussed during consultations. ***(Comment No. 197616-065)***

Response To: Comment 197616-065

BLM's planning process allows many opportunities for public involvement. Furthermore, to allow additional time for North Slope residents to review and comment, BLM extended both the scoping and the Draft comment periods for the Northeast amendment. Also, in addition to public meetings held in all affected North Slope communities during the Draft comment period, the BLM held separate ANILCA 810 meetings in Barrow, Anaktuvuk Pass, Nuiqsut and

Atqasuk after the close of the Draft comment period; also see Chapter 5 Consultation and Coordination.

TOPIC: TRADITIONAL KNOWLEDGE

Comment From: Conoco Phillips (Comment Letter No. 196557)

Pages 4-403 to 4-409, Table 4-27, Summary of Traditional Knowledge/Local Knowledge. This table includes quotes from testifiers from as far back as the mid-1970s. Many of the comments reference activities that have not been used on the North Slope for decades. Some of the listed effects that are correlated to individual comments appear speculative and not directly tied to the activity mentioned in the comment. There is no evidence to indicate that many of the issues discussed in the comments were related to oil and gas activity. In contrast, many of the issues, such as low water levels, are naturally occurring phenomenon and have no relation to human-induced activities. Also some listed effects are so far removed distance-wise from the activity discussed in the comment, that there is no possible way they could be connected. We understand the importance of actual traditional knowledge, but recognize that just because an individual makes a statement does not mean it is true or has undergone enough scrutiny to be published as true, which is what the lay reader will assume. This table needs to be completely redone. The reference to the table at the bottom of page 4-402, and the table itself, need to state that the information in the table has not been verified and that the impacts are not proven to be caused by oil and gas activities. ***(Comment No. 196557-102)***

Response To: Comment 196557-102

There is no academic peer review process for Traditional Knowledge and Local Knowledge. Traditional Knowledge is an expression of information that is important to the survival of the group that has been tested by multiple generations. Local Knowledge is the expression of information that has not necessarily been tested by multiple generations. Local Knowledge will often include observed phenomenon, a hypothesis about the cause of the observed phenomenon, associated observations of potentially related phenomena, and informed speculation about the potential effects of the phenomena (USDOI BLM 2004). As noted on page 4-402 of the Draft Amended IAP/EIS, these comments reflect the concerns of the local residents, and thus are not necessarily a statement of fact or an indictment of the oil industry. The text on this page has been revised to note that issues and concerns identified in Table 4-27 are the result of both natural and man-made causes, and that man-made causes can include non-oil and -gas activities.

TOPIC: TRAFFIC: AIRCRAFT, WATERCRAFT, PEDESTRIAN

Comment From: Aaron Wernham (Comment Letter No. 195986)

Alaskan Natives have had to shift the season of Bowhead hunting, and this may coincide with the season of increased boat traffic in the area. ***(Comment No. 195986-004)***

Response To: Comment 195986-004

See response to comment 195986-004 under Subsistence

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

The discussions of impacts on molting geese due to aircraft disturbance are inadequate. Brant are not even mentioned as a species (pp. 4-99+, 4-205+, and 4-288+), and there is little in the way of discussion of the substantial literature on this subject. For example, on p. 4-205, the DEIS states: "...some birds could acclimate to aircraft activity by either remaining in habitats located near aircraft activities, or by moving to nearby habitats." This statement significantly downplays the likely impacts that air traffic has on molting brant, because, in fact, many investigators (e.g., Derksen et al. 1992) have documented that brant are not easily habituated to aircraft overflights. ***(Comment No. 197610-057)***

Response To: Comment 197610-057

See response to comment 197619-007 under Basic Assumptions - New Studies, Information, or Technology

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

On p. 4-99, the DEIS states: "Johnson et al. (2003b) [cited in the DEIS] conducted the most thorough study of aircraft disturbance to waterfowl in the Arctic at the Alpine Project." This study—the results of which cannot be found in the open, peer-reviewed literature—concerns effects on breeding, not molting birds. Hence, it is of no relevance to a discussion of impacts on molting geese, which is the primary conservation concern for birds in the Teshekpuk Lake area. ***(Comment No.* 197610-058)**

Response To: Comment 197610-058

Much of the data describing resources and potential impacts in the National Petroleum Reserve-Alaska comes from unpublished reports from both industry and agencies. The EIS was updated to more thoroughly discuss potential aircraft disturbance and its effects on molting geese.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

As part of the discussion on the effects of aircraft disturbance of molting geese, it would be highly relevant to discuss the number of flights to and from the Alpine airstrip in relation to the number of flights originally projected for that facility. We understand that the actual number of flights is far higher than projected. The more remote the site, the more that aircraft will be used for access. Unless all activity will shut down when molting geese are present, such flights—even on the periphery of the 213,000 no-lease zone—would present a serious source of disturbance to geese during one of the most sensitive phases of their annual cycle. ***(Comment No.* 197610-059)**

Response To: Comment 197610-059

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 4.4.8.2 Oil and Gas Development, Activities, Air Traffic of the EIS, "Under the full development scenario for the Preferred Alternative the projected number of flights per day may range from 50 to 90 depending on the phase of development. These numbers are based on the number of flights that occurred during the Alpine Field development (USDOI BLM 2004). The effects of aircraft disturbance would likely have moderate effects on waterfowl and shorebirds."

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Humans and aircraft at distances from 10 to 490 ft, respectively, have been known to flush spectacled eiders from their nests (G. Balogh, USFWS, 1997, pers. communication 2002; Petersen et al. 2000). Although there is a low altitude limit on aircraft overflights in the oil fields, increased flights in marginal weather have the potential to disturb nesting birds. Early nests are more successful than delayed nests (Petersen et al. 2000). Delayed nesting due to disturbance or re-nesting caused by increased predation or development activity may lower nesting success. ***(Comment No.* 197610-086)**

Response To: Comment 197610-086

The potential impacts of aircraft disturbance and increased levels of predation are pointed out in the EIS. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife including threatened eiders to the potential impacts of oil development. Specific regulations require measures to minimize or eliminate the potential for increased predation on tundra nesting birds. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern. Additions have been made to the EIS to further emphasize the effects of aircraft

disturbance to molting geese, particularly brant.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

That doesn't really tell us anything. The severity of the impact is a function of the amount of air traffic. Will air traffic increase from one flight a week over the Teshekpuk Lake Special Area to two flights per week, or to 100 flights per week? Other than some discussion in the cumulative impacts section that is based on unsupported an unrealistically low estimates of the number of flights that a roadless facility would require150 there is no estimate of the number of flights needed to develop and support roadless facilities in the Teshekpuk Lake Special Area. In order to accurately consider the impacts of roadless development in the Teshekpuk Lake Area, or anywhere else in the Northeast NPR-A for that matter, the Amended Draft EIS needs to consider the actual amount of aircraft disturbance and not provide some meaningless statement that aircraft traffic will increase. ***(Comment No.* 197616-155)**

Response To: Comment 197616-155

The amount of air traffic over Teshekpuk Lake would depend upon the location and types of sites that must be reached by plane that are near Teshekpuk Lake, and whether or not it was necessary to fly over the lake to reach these sites. We agree that the number of flights given on page 4-382 is low based on aircraft traffic associated with the Alpine field, and have revised the estimates of flight activity upward in the Final Amended IAP/EIS.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Amended Draft EIS is at page 4-382. This says that if two major roadless developments (2 CPFs, each with 5 satellites) are built at the same time then "approximately 28 to 56 round trips [via aircraft] per month could be required during the development period and 12 to 28 round trips per month could be required during the production period." Based on our direct experience, this estimate is complete and utter nonsense. The development of the Alpine CPF and its satellite at CD-2 required more than 400 round trips during some months, and even after start-up of both the Alpine CPF and CD-2 the Alpine airstrip still received over 125 round trip flights per month. (See footnote 153 below). ***(Comment No.* 197616-156)**

Response To: Comment 197616-156

See response to comment 197616-155 under Traffic: Aircraft, Watercraft, Pedestrian

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Estimates of the number of air craft flight necessary to develop and operate roadless facilities in the NPR-A should be based on actual experiences with the construction and operation of the Alpine development. A partial summary of Alpine's aircraft flights can be found in the June 2002 Colville River Unit Satellite Development Revised EED, p. 2-33 (depicting the number of round trips to Alpine between May 2000 and February 2002.) ***(Comment No.* 197616-157)**

Response To: Comment 197616-157

The number of aircraft flights necessary to develop and operate roadless facilities in the Planning Area has been revised in the Final Amended IAP/EIS to correspond more closely with flight activity recorded during construction and operation of the Alpine field, as discussed in the Alpine Satellite Development Plan EIS (USDOI BLM 2004).

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS describes effects of disturbance to birds and molting geese on p. 4-203. However, this analysis does not clearly address the issues of increased public access. This must be corrected. The draft Amended IAP/EIS continues on 4-205 by stating "some birds could acclimate to aircraft activity by either remaining in habitats located near aircraft activities, or by moving to nearby habitats." This statement significantly downplays the likely impacts

that air traffic has on molting brant because many investigators (e.g., Derksen et al. 1992) have documented that brant are not easily habituated to aircraft overflights. Furthermore, birds displaced from their optimal habitat may undergo nutritional stress. Considering the uniqueness of the Teshekpuk goose molting area, significant disturbance and/or displacement of geese could result in population-level impacts. **(Comment No. 197617-089)**

Response To: Comment 197617-089

See response to comment 197619-007 under Basic Assumptions - New Studies, Information, or Technology

Comment From: Environmental Coalition (Comment Letter No. 197617)

Noise disturbance: Bowheads, like all other marine mammals, live in a sound environment influenced by both natural and man-made factors. Noise in the marine environment is a major habitat issue with respect to offshore development and bowhead whales, and certain noise sources have been shown to cause behavioral changes in individual whales. There has been an increase in the underwater noise levels in the Beaufort Sea as a result of oil and gas and other industrial activities (67 Fed. Reg. 55768). The major sources of noise disturbance on bowheads from oil and gas activities is: seismic exploration; other industrial activities including drilling; dredging and construction; ships and boats; and aircraft. The draft EIS/IAP recognizes the risk for noise disturbance associated with development in the Reserve, but writes it off as negligible. Yet, the document fails to provide any scientific support for the assertion that such disturbance is not significant and therefore does not constitutes harassment under the ESA. Assessing the effect of industrial noise on bowhead whales is complex. Despite the complexity of the science and the many unknown variables, it is clear that industrial noise associated with oil and gas development in the Arctic may effect bowheads in three major ways: avoidance, masking, and temporary or permanent hearing impairment. Noise from fixed wing aircraft and helicopter associated with oil and gas activity and infrastructure also has the potential to harm or harass bowhead whales. Bowheads seem particularly responsive to noise from aircraft when they are in shallow water and when they are resting. The draft IAP/EIS fails to take a hard look at noise impacts from boat and air traffic and fails to analyze the cumulative impact of such traffic on bowheads from this project in conjunction with other boating activity in the bowheads migration area. **(Comment No. 197617-139)**

Response To: Comment 197617-139

As indicated in the IAP/EIS there would be negligible impacts from noise associated with potential onshore developments because the sound does not propagate into the offshore environment unless the development occurred right on the coast. In such a case sound would only be detectable for a relatively short distance and would be indistinguishable at 10-15 miles from shore where bowhead whales would be present. Individual whales that entered Harrison Bay could be exposed to increased noise associated with a development located on the coast. Potential impacts associated with increased barge traffic and aircraft are discussed in the IAP/EIS.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The Biological Assessment predicts "similar levels of aircraft activity during the summer development phases for each of the CPF developments" as Alpine. Biological Assessment at D-14. It relies on stale Alpine flight data, which should be brought up to date. Further, it fails to include all potential developments, focusing only on CPFs. **(Comment No. 197617-147)**

Response To: Comment 197617-147

The biological assessment has been updated with the most recent data available. This represents the best data to make reasonable estimates of flight numbers. The revised biological assessment includes flights for CPFs and satellites as well as estimates of non-operational flights.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

2.6.2.2, Page 2-23, F- 1 ROP: Derksen et al. (1 992) reported that ". . .aircraft disturbance can influence the movements of geese; potentially causing increases in energetic costs and possibly having a negative influence on use of optimal habitats." Their report recommended that aircraft should maintain altitudes of > 1,070 m to reduce disturbance. The current stipulation suspends helicopter overflights in the Goose Molting area from June 15 - Aug. 20 (pg. 2-65); Alternatives B and C have eliminated this stipulation despite documented effects of air traffic on sensitive molting geese. An additional Requirement/Standard should be developed for this ROP that prohibits air traffic at altitudes less than 1km above the goose molting area from June 15 – Aug 20 to avoid disturbance effects to molting geese. ***(Comment No.* 197618-029)**

Response To: Comment 197618-029

Required Operating Procedure F-1 e says aircraft shall maintain an altitude of 2,000 feet (except for take off and landings) over the Teshekpuk Lake Caribou Habitat Area which totally encompasses the goose molting area north of Teshekpuk Lake. We have added appropriate cross references to clarify.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.9.2, Page 4-214, Activities Not Associated with Oil and Gas Exploration and Development, Paragraph 2: Please add a sentence at the end of this paragraph that states that overland traffic could disturb denning bears, potentially resulting in abandonment of the den site and death of cubs. ***(Comment No.* 197618-087)**

Response To: Comment 197618-087

The Final IAP/EIS has been revised in consideration of your comments. The sentence referenced in the comment was added to the first paragraph in Section 4.4.9.2 Marine Mammals, Activities Not Associated with Oil and Gas Exploration and Development.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.5.8.2, Page 4-289, Effects of Disturbances, Oil and Gas Development, Air Traffic: Under Alternative C, aircraft traffic, including takeoffs and landings, apparently could occur within the entire Goose Molting Area. Derksen et al. (1992) did not detect any habituation by molting brant to helicopters on a daily or seasonal basis and predicted serious reductions in body weight at high helicopter travel frequencies. Given the uniqueness of the Goose Molting Area and the status of the brant population, frequent aircraft activity could have serious population-level impacts. While disturbance effects of ground activities (construction and operation on roads and pads) have not been adequately examined, results obtained from helicopter disturbance studies suggest that ground disturbances could have serious impacts as well (Page 4-288). Our comments (above) for Section 4.4.8.2, Page 4-205, Effects of Disturbances, Oil and Gas Development, Activities, Air Traffic are incorporated here by reference. ***(Comment No.* 197618-094)**

Response To: Comment 197618-094

See response to comment 197619-007 under Basic Assumptions - New Studies, Information, or Technology

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.7.8, Page 4-421, Birds: Pre-migratory staging shorebirds may be particularly susceptible to disturbance associated with aircraft flying over the delta as people travel to the various pad sites. Staging birds are typically very prone to fly when disturbed, which could interrupt feeding and prevent them from gaining the necessary fat to successfully migrate to the lower portions of North America and Latin America. This may be especially problematic for Dunlins, the most common staging bird in the area, as they are also undergoing an energetically expensive, premigratory molt at this

time. Given that there are a limited number of staging areas along the North Slope, birds might have few options for moving to new areas that provide comparable resources. **(Comment No. 197618-109)**

Response To: Comment 197618-109

The BLM considered your comments during the development of the Final IAP/EIS.

Comment From: Stan Senner (Comment Letter No. 197978)

I also find in viewing the Draft Environmental Statement that the description of impacts are inadequate with respect to molting geese. For example, there is an extended discussion of disturbance by air traffic, and it doesn't mention brant. Astonishing. There's also, for example, much discussion of a report by Johnson, et al., 2003 at the Alpine Satellite fields, a study on aircraft disturbance, the Draft Environmental Statement says this is the most comprehensive study of air traffic disturbance on the North Slope. That's great, it all concerns nesting birds. It's not a study of molting geese. And hence again, the discussion air traffic impacts and other disturbance on molting geese is simply completely inadequate. **(Comment No. 197978-091)**

Response To: Comment 197978-091

The EIS has been revised to reflect your comments.

TOPIC: TRANSPORTATION

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Page 3-112, Transportation: the discussion of transportation beginning on page 3-112 contains no mention of the potential for ice road routes for support of winter exploration to extend northwest to Barrow, rather than connect with the Prudhoe Bay/Kuparuk transportation system. Such a route was proposed in association with ConocoPhillips' recent Puviaq exploration project. The successful use of Barrow as a staging area for exploration or development could stimulate greater interest in leasing, exploration, and development of Northwest planning area tracts, and could have cascading effects on a range of resources within and outside of the Northeast planning area. The potential also that development of coastal staging areas could stimulate greater offshore activity and development clearly merits more robust analysis in both the Northeast-specific and cumulative effects sections of the document. **(Comment No. 196407-089)**

Response To: Comment 196407-089

Although Barrow could serve as a staging area for exploration or development, it is more likely that ice roads would connect with the Prudhoe Bay/Kuparuk transportation system because of its close proximity to those portions of the National Petroleum Reserve – Alaska with the greatest potential to have economically recoverable deposits of oil. Information on potential staging sites in the northwestern portion of the National Petroleum Reserve – Alaska, as taken from Page III-137 of the Northwest IAP/EIS, has been included in Section 3.4.8.5, National Petroleum Reserve – Alaska Facilities.

TOPIC: TUNDRA TRAVEL

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-19: ROP C-2a. CPAI commends BLM for adopting this requirement/standard that states "Ground operations shall be allowed only when frost and snow cover is at sufficient depths to protect the tundra." This replaces the previous strict blanket requirement of 12 inches of frost and 6 inches of snow regardless of the type of vehicle used. But, this requirement is listed under the heading "Winter Overland Moves and Seismic Work" and therefore applies to

use of heavy equipment on non-roaded surfaces during the winter season. As such, it is unclear what stipulations, if any, address tundra travel outside the winter season. The State of Alaska allows low-ground-pressure vehicles to be used after spring breakup, usually starting around July 15 of each year. The State has a list of vehicles approved for summer tundra travel. Use of this equipment is allowed until winter tundra travel is suspended, normally around May 15 of each year. ***(Comment No. 196557-056)***

Response To: Comment 196557-056

Tundra travel is only permitted during winter conditions.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Section 4.2 of the DEIS, "Ground-Impacting Management Actions", is divided between "Activities Not Associated With Oil and Gas Exploration and Development" (Section 4.2.1.1) and "Oil and Gas Exploration and Development Activities" (Section 4.2.1.2). Section 4.2.1.1 includes a discussion of Overland Moves and Other Land Use Permits that describes BLM's ability to issue minimum impact permits for overland moves, and mentions that the poor soil conditions in the Planning Area limit BLM's approval of most land use proposals for summer operations. This implies that BLM does issue some approvals for summer tundra travel – but, this same discussion is not present at Section 4.2.1.2 that relates to oil and gas activities. It is unclear why such approvals could be issued for other activities but not for oil and gas activities. From our past conversations with BLM, we have been told that the intent is not to disallow summer tundra travel in a manner consistent with that of the State of Alaska. CPAI requests that a specific stipulation be included if necessary to clarify such use. ***(Comment No. 196557-057)***

Response To: Comment 196557-057

The title of Section 4.2.1.1 is Activities Not Associated With Oil and Gas Exploration and Development, with sub-heading Overland Moves and "Other" Land Use Permits. In this section we acknowledge that there are permits issued that allow summer activity, but these "Other" permitted activities (for example, a permit for a wildlife observation cabin on the shore of Teshekpuk Lake) would have minimal, if any, effects on tundra because access is by float plane. Another example of "Other" permits issued in the summer would be a special recreation permit issued to a recreational guide, and the method of travel through the area is likely to be by river or foot.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

We were told during scoping that the criteria for tundra travel opening was being evaluated, and that this was a reason to revisit the 1998 NE NPR-A ROD. In our NE NPR-A Scoping Letter, we pointed out how the evaluation of the criteria for opening tundra travel was not completed and that the evaluation itself appeared to be driven by a goal to increase the number of tundra travel days, which could taint its objectivity. p. 18. Amended Draft EIS p. 4-19 says that based on this evaluation, tundra travel will now be opened by type of equipment. This has apparently led (although it is not at all clear in the Amended Draft EIS) the BLM to propose a change from the 1998 NE NPR-A ROD, Stipulation 24e which requires 12 inches of frost and 6 inches of snow cover to a ROP allowing tundra travel when "frost and snow cover is at sufficient depths to protect the tundra." Amended Draft EIS p. 2-18 and 2-19. ***(Comment No. 197616-028)***

Response To: Comment 197616-028

The statement on page 4-19 regarding tundra opening being based on type of equipment refers to State of Alaska policy not BLM policy.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

However, the Amended Draft EIS does not make note of this change in its analysis of the impacts under Alternatives B and C. See e.g. Amended Draft EIS p. 4-178 discussing the potential for thermokarsting under Alternative B which

identifies "the requirement that snow depth would average 6 inches before overland activities could commence" as minimizing damage to tundra. Assuming that there is no additional damage to tundra when tundra travel is opened by vehicle type, this minor change in management does not require the full blown amendment to the Northeast NPR-A EIS/IAP and ROD that we see happening here because it could have been accomplished through an Environmental Assessment followed by a Finding of No Significant Impact. **(Comment No. 197616-029)**

Response To: Comment 197616-029

The Final IAP/EIS has been revised to note that "ground operations shall be allowed only when frost and snow cover is at sufficient depths to protect tundra," as noted in ROP C-2 (a).

TOPIC: VEGETATION

Comment From: The Nature Conservancy (Comment Letter No. 197609)

Similar to some species, a number of terrestrial ecosystems defined for the assessment occur only on the Beaufort Coastal plain.' Four of these ecosystems (coastal wet sedge 16 tundra, lowland lake, coastal barrens, and coastal grass and dwarf shrub tundra) are significantly represented inside the current surface protection area but outside the area proposed closed to leasing in Alternative B (see table on following page). These four ecosystems are also greatly underrepresented in the conservation network in the ecoregion; only 4% or less of each system's ecoregional distribution in the coastal plain is located on lands managed for conservation. **(Comment No. 197609-016)**

Response To: Comment 197609-016

We indicate in our discussion of impacts that the wetland classes of vegetation are likely to be impacted to a greater extent under the Preferred Alternative and under Alternative C if development occurs in the area around Teshekpuk Lake. Most coastal barrens would be protected by the required 3/4 mile setback from the coast.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Studies conducted since 1998 have shown that the TLH calve in areas dominated by Wet Graminoid, Moist Graminoid and Moist Tussock. Compare this with the Western Arctic Caribou Herd ("WAH") which calves in areas where Moist Dwarf-Shrub and Moist Low-Shrub dominate.139 We could not find data detailing what vegetation type dominates the area where the CAH calve, but given the geographic similarities between where the WAH and the CAH calve, we think it is likely that they both calve in areas dominated by the same types of vegetation. 140 Until the Amended Draft EIS takes these factors into consideration, conclusory assertions that the TLH can shift its calving grounds without consequence are only wishful thinking. **(Comment No. 197616-143)**

Response To: Comment 197616-143

It was not the intent of the Draft EIS to assert that there would be no consequences of shifting the TLH calving grounds. We have added additional analysis to sections in Chapter 4 for each alternative and for the cumulative effects section. Briefly, cumulative oil and gas development on the North Slope could result in a long-term displacement and/or functional loss of habitat for CAH, TLH, and WAH caribou over the productive life of the leases. At present, cumulative oil development in the Prudhoe Bay-Kuparuk area has caused displacement of CAH caribou from a portion of the calving range, with a shift in calving distribution away from the oil fields (Nellemann and Cameron 1996; Lawhead 1997; Cameron et al. 2002; NRC 2003). Additionally, studies done over the last decade have indicated that TLH caribou show high fidelity to the calving area near Teshekpuk Lake and that caribou that calve in the traditional calving area have much higher calving success than caribou calving outside the area.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.3.8.4, Page 4-106, Conclusion: The effects of water draw down on vegetation important as forage for molting geese

are unknown. If draw down were to significantly damage important vegetation geese would either be displaced or negatively impacted. ***(Comment No. 197618-073)***

Response To: Comment 197618-073

Lake recharge in the spring occurs before vegetation breaks dormancy. During this time extensive sheet flow of water results in flooding of the tundra. It is very unlikely that lake draw down during winter would affect the vegetation in and around the lake.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 3, Affected Environment, Section 3.3.2, Vegetation, Paragraph 5, Page 3-29. The last sentence of this paragraph discussing shrubs in the planning area - "With the exception of birds, the remainder are dwarf shrubs" - needs to be corrected. ***(Comment No. 197620-051)***

Response To: Comment 197620-051

The text in Section 3.3.2 has been corrected.

Comment From: Rosemary Ahtuangaruak (Comment Letter No. 197990)

When there are activities created with oil and gas development, it's very different than the activities we do for subsistence. The changes in transportation has caused a lot of trails and changes to the water accumulation in these areas. There's a lot more ponding in areas that have been used for ice roads and other activities. The ponding creates crevices in the land and it damages the vegetation. There's areas that were available for nesting and such that get under water after the usage occurs. There's increased concentration to activities from our community because there's diversion from other areas that are already being developed and are being explored and developed. So those increased concentrations from our village are now into the areas of this Northeast NPR-A. ***(Comment No. 197990-078)***

Response To: Comment 197990-078

These issues are addressed in Sections 4.3.5.3 and 4.3.8.2 of the FEIS.

TOPIC: VISUAL RESOURCES

Comment From: Environmental Coalition (Comment Letter No. 197617)

VISUAL RESOURCES In the 4.9.17 draft IAP/EIS discussion of Irreversible and Irretrievable Commitment of Resources, for Visual Resources the draft IAP/EIS asserts that: There would be no irreversible or irretrievable commitment of visual resources. Proper removal, rehabilitation, and revegetation of development pads and other facilities would restore the perception of a natural environment. To the casual observer, viewsheds would appear natural. Id. at 4-434. Elsewhere in the document, BLM asserts that there would be no requirement that gravel be removed. See, e.g., id. Vol. 2, App. at D-15 ("Gravel or gravel/sand pads would not be removed by allowed to bed naturally. Overall, abandonment operations would take many years"). In the Alpine Satellite draft EIS, some alternatives also propose that gravel roads and pads would be left in place. Further, the drafted IAP/EIS indicates that the "burial of vegetation under gravel fill could be considered an irretrievable commitment of vegetation resources" given the potential recovery time. Id. at 4-431. Thus, subsection 4.9.17 inaccurately concludes that the perception of the natural environment would be restored. This also means that draft IAP/EIS inaccurately assesses impacts to wilderness values. These inaccuracies must be corrected in any final EIS. ***(Comment No. 197617-131)***

Response To: Comment 197617-131

See response to comment 197620-080 under topic Site Clearance and Requirements for Abandonment and Restoration. The text on the effects to visual resources in Chapter 4, Environmental Consequences, has been revised to note that roads and pads could be left in place and could have a long-term impact on the visual environment.

TOPIC: WATER DEMAND

Comment From: Aaron Gilliam (Comment Letter No. 086081)

I'm sure you are very informed on the type of procedures required to drill in the arctic. The drilling rigs require mile of ice roads and platforms just to get to the drilling areas. You know better than anyone that there is not enough fresh water in the reserve to make even a small fraction of all the ice roads and platforms that the drilling would require. Not many people know that this type of project would also be destroying the fresh water reserves of the refuge and i urge you to make your decision with this in mind. **(Comment No. 086081-002)**

Response To: Comment 086081-002

Protection of water resources in the National Petroleum Reserve-Alaska is of paramount importance. The stipulations and ROPs provided in the IAP/EIS are intended to protect these water resources, and their implementation is expected to afford adequate protection to water resources, riparian habitats, and wildlife ecosystems which are dependent on these water resources. ROP B-2 provides water withdrawal requirements, and also states that water withdrawal from lakes may be authorized on a project-specific basis to ensure that the fresh water reserves in the Planning Area are protected. Recent studies have shown that if water is removed during the winter, the lakes refill during snowmelt in spring.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Development and Production - Water Demand. This section only addresses water used for drilling and camp use, but ignores water needed for ice roads in the event that production sites are not located on a road network. If ice roads are not needed during the production phase because roads will be built, this should be clearly stated. **(Comment No. 197617-050)**

Response To: Comment 197617-050

Water requirements are discussed under several subheadings in Chapter 4. Water demand for seasonal ice roads and drilling pads during exploration is discussed on page 4-14 of the Draft Amended IAP/EIS. Water demand associated with exploration drilling and camps is discussed on page 4-19. Water demand for construction and development drilling is discussed on page 4-25, while water demand for waterflooding operations during production is discussed on page 4-26. Water demand for ice roads built to service production facilities would be similar to those constructed during exploration. Impacts to water resources, fish, birds, and other resources from construction of ice roads during exploration are discussed for each alternative. Similar impacts would be expected if ice roads were constructed to service production facilities. A sentence was inserted after paragraph (on page 4-25) that states "Water requirements for ice roads need for access to drilling areas are discussed under section 4.3.4.1 (Water Resources, Effects of Disturbances, Ice Road and Pad Construction)."

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

D.4.2.4, Page 0-27, Withdrawal of Freshwater From Lakes and Ponds, Paragraph 2: Emphasis should be placed on protecting ponds and lakes that are used for nesting and brood-rearing. **(Comment No. 197618-115)**

Response To: Comment 197618-115

As noted under ROP B-2, water withdrawal from lakes can be evaluated on a project-specific basis to ensure that ponds and lakes are protected. In addition, Lease Stipulation K-4(a) states that water removed from lakes used by molting geese shat not alter the hydrological conditions that could adversely affect goose-feeding habitat along the lakeshore. Although hens and broods would use lakes that may not be attractive to molting geese, these ROPs and stipulations should be affective in protecting most habitats.

Comment From: State of Alaska (Comment Letter No. 197620)

Goose Molting Area Lake Water Resources We recommend the final EIS provide an assessment on the depth and potential water availability in the goose molting area lakes north and east of Teshekpuk Lake. Map 3-8 appears to provide the only information regarding lake depth for lakes in this area. From this map, few lakes would appear to have water in winter for use. As a result, selected lakes would require substantial withdrawal during exploration and development. While exploration water withdrawals may be limited in scope and may be dispersed over many lakes, development drilling and operations would potentially require substantial amounts of water over a number of years from one or a few lakes proximate to the drill site. ***(Comment No. 197620-030)***

Response To: Comment 197620-030

All lakes permitted for water withdrawals have bathymetric surveys performed as part of the permit and are evaluated for the presence of fish. Baseline water chemistry is also obtained during these surveys. Recharge of lakes can be of concern for waterbodies which are isolated from other waterbodies during breakup. This is not the case for those lakes in the vicinity of Teshekpuk Lake. Water withdrawals from lakes at critical habitat sites will need to be evaluated for recharge on a case-by-case basis. The ROP B-2 Objective and B-2 d concerning water use have been modified to reflect concerns for the recharge of lakes necessary for waterfowl habitat.

Comment From: State of Alaska (Comment Letter No. 197620)

We further recommend an assessment of lake recharge/recharge potential in this area. Of particular concern are the potential effects or changes to shoreline structure, emergent and shoreline vegetation that could adversely affect areas used by large numbers of molting geese. While lease stipulation K-4 states water withdrawal shall not alter hydrological conditions that could adversely affect goose feeding habitat around lakeshore margins, the fact remains that extensive water use will be required for exploration and development within the this area. A thorough discussion of the potential effects of short-term and long-term water withdrawal to lakes in the goose molting area and the biological resources that use them should be provided. ***(Comment No. 197620-031)***

Response To: Comment 197620-031

The ROP B-2 Objective and B-2 d concerning water use have been modified to reflect concerns for the recharge of lakes necessary for waterfowl habitat and now read as follows:

B-2 Required Operating Procedure
Objective: Maintain natural hydrologic regimes in soils surrounding lakes and ponds, and maintain populations of, and adequate habitat for, fish, invertebrates, and waterfowl.

d. A water-monitoring plan may be required to assess draw down and water quality changes before, during, and after pumping any fish-bearing lake or lake of special concern.

Chapter 4 does provide a discussion of the effects of water withdrawal.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative A, Section 4.3.4.1, Water Resources, Ice Road/Pad Water Use, Pane 4-64. This paragraph regarding water withdrawal for ice road and pad construction notes that a 259 acre-foot withdrawal of water would cause a drawdown in lake level of about 1.4 feet for a lake with a surface area of 184

acres. While this may be accurate for a summer withdrawal, given the irregular bathymetry of lakes in the area coupled with the presence of ice, which greatly reduces the effective surface area of free water in a lake in winter, a 259 acre-foot withdrawal would produce a significantly greater drawdown then demonstrated in the example. ***(Comment No.* 197620-074)**

Response To: Comment 197620-074

The text in Section 4.3.4.1 has been revised to state: "These estimates are for summer water withdrawal; withdrawal of water during winter months could exceed these estimates."

TOPIC: WATER RESOURCES

Comment From: Ruth S. Sperling (Comment Letter No. 196041)

Alterations of water ecosystems through withdrawal of freshwater and construction of petroleum-related facilities. ***(Comment No.* 196041-007)**

Response To: Comment 196041-007

Withdrawal of fresh water for construction and petroleum-related facilities should not affect riparian habitats because of the protection to water resources afforded by the stipulations and ROPs that will be applied to use of all water resources in the National Petroleum Reserve-Alaska.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Amended Draft EIS p. 4-194. The Amended Draft EIS, while discussing water resources, says that extensive use of lakes for water withdrawals could have "long term cumulative impacts on the Planning area, despite the restrictions imposed by the stipulations and ROPs." Amended Draft EIS p. 4-371 (Water resources section). ***(Comment No.* 197616-112)**

Response To: Comment 197616-112

As discussed in the NRC (2003:206) report on Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope, few affects to fish have been documented when water withdrawals from fish-bearing lakes are limited to 15 percent or less of the estimated minimum winter water volume. The effects on plants and animals in lakes that do not support fish have not been well studied. The full amount of water in these lakes is not available for removal, because much of the water is frozen. Effects to invertebrates are likely to not be significant because during winter most invertebrates inhabiting shallow lakes are in the freeze-tolerant resting stages, although invertebrates that are removed from the lake would be displaced. Much, if not all of the water removed from lakes would be replaced during spring snowmelt.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative A, Section 4.3.4.2, Water Resources, Surface Water and Groundwater Quality, Page 4-67. The third paragraph on Page 4-68 discusses the results of a study regarding reserve pits and hydrocarbons; however, no citation is provided in the text. The subsequent paragraph states that lining and berming reserve pits would not be necessary to protect tundra from contamination. Current industry practice is to use tanks and re-inject muds and cuttings to avoid the use of reserve pits common in early North Slope exploration and production drilling. Chapter 4, Environmental Consequences, Alternative A, Section 4.3.7, Fish, Freshwater and Anadromous/Amphidromous Fish, Page 4-8 1. The second paragraph notes that seismic surveys could produce acoustic pulses that are lethal to juvenile fish yet that would only cause temporary discomfort to adult fish. As these pulses are perceived by fish as changes in pressure, severe differential effects related to size, such as those produced by electrical current, would not be expected to occur.

Response To: Comment 197620-075

The BLM has considered your comments on the current industry practice for storage of drilling wastes and has altered the text in Section 4.3.4.2 in the Final IAP/EIS.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative B, Section 4.4.4, Water Resources. Effects of Disturbance, Drainage Disruption, Page 4-1 79. The second paragraph of this section notes that culverts must have ample capacity to handle the flow of the drainage during spring breakup to avoid ice jams. Generally, ice jams are not the problem associated with undersized culverts. If culverts are not adequately sized for the drainage, high flows often cause failure of the culvert and a portion of the road. This causes gravel deposition in the stream downstream of the culvert which may impede fish passage. Undersized culverts often have water velocities that exceed that of the free-flowing stream, thereby impeding or preventing efficient upstream movement of fish through the culvert. Undersized culverts also lead to downstream channel scouring. ***(Comment No.* 197620-086)**

Response To: Comment 197620-086

The text in sections 4.4.4.1 and 4.5.4.1 has been revised to note the problems associated with undersized culverts.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative B, Section 4.5.4, Water Resources, Effects of Disturbance, Drainage Disruption. Page 4-270. The second paragraph of this section notes that culverts must have ample capacity to handle the flow of the drainage during spring breakup to avoid ice jams. Generally, ice jams are not the problem associated with undersized culverts. If culverts are not adequately sized for the drainage, high flows often cause failure of the culvert and a portion of the road. This causes gravel deposition in the stream downstream of the culvert which may impede fish passage. Undersized culverts often have water velocities that exceed that of the free-flowing stream, thereby impeding or preventing efficient upstream movement of fish through the culvert. Undersized culverts also lead to downstream channel scouring. ***(Comment No.* 197620-094)**

Response To: Comment 197620-094

The text in sections 4.4.4.1 and 4.5.4.1 has been revised to note the problems associated with undersized culverts.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative C, Section 4.5.4, Water Resources, Oil and Gas Development Activities. Under-Ice Oil Spills. Page 4-272. The second paragraph in h s section notes that lakes that are non-fish bearing are not regulated with setbacks; however, see Stipulation E-2 which indicates 100 foot setbacks are applicable to non-fish bearing waterbodies. ***(Comment No.* 197620-095)**

Response To: Comment 197620-095

The text in sections 4.4.4 and 4.5.4 has been revised to note that permanent oil and gas facilities cannot be built with 100-foot setbacks of non-fish-bearing waterbodies with approval of the Authorized Officer.

TOPIC: WATER WITHDRAWAL

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-17: ROP B-1, Requirement/Standard. This states "Water withdrawal from rivers and streams during winter is

prohibited." It should be acknowledged that the State of Alaska now allows winter water withdrawal from the Colville River to construct an annual ice bridge. CPAI requests that BLM modify this ROP by adding a statement such as "Winter water withdrawal from rivers or streams will be allowed on a site-specific basis after consultation with the Alaska Department of Natural Resources, the Alaska Department of Fish and Game, the North Slope Borough, and local residents." ***(Comment No.* 196557-050)**

Response To: Comment 196557-050

Any exceptions that are requested will be addressed at the permitting/authorization phase.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-17: ROP B-2a. This statement needs to be clarified that this criterion is applicable to those lakes with fish identified by ADNR OHMP as being sensitive to water withdrawal (e.g. grayling, whitefish). ***(Comment No.* 196557-051)**

Response To: Comment 196557-051

ROP B-2a as stated applies to all fish bearing lakes, not to specific fish bearing lakes and will remain so in order to make sure that all fish species are protected from water withdrawal activities.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-18: ROP B-2b. The current criterion allowed by the ADNR OHMP for these types of lakes is 30% under 5 feet of ice and this should be clarified. It is important to also note that there is a collaborative study underway between ADNR OHMP, CPAI, BLM and UAF on the effects of water withdrawal on water quality and fish (namely ninespine stickleback and Alaska blackfish) in a shallow (6 feet) NPRA lake. The intent is to demonstrate that water volumes higher than that currently allowed by ADNR for resistant species can be removed from these lakes without adverse impacts to the water quality or resident fish. ***(Comment No.* 196557-052)**

Response To: Comment 196557-052

ROP B-2 has been modified.

Comment From: Conoco Phillips (Comment Letter No. 196557)

Page 2-18: ROP B-2c. This statement is confusing because criteria exist for withdrawing water from fish-bearing lakes as noted above. Suggest rewording this to say that if no fish are identified as present in a lake, the available water under-ice may be authorized for withdrawal. ***(Comment No.* 196557-053)**

Response To: Comment 196557-053

Stipulation B-2c says "water withdrawal may be authorized from any lake if the proponent demonstrates that no fish exist in that lake."

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative B, Section 4.4.4, Water Resources, Effects of Disturbance. Ice Roadpad Water Use, Page 4-1 78. This paragraph incorrectly states the under-ice water withdrawal conditions for this alternative. This alternative, as with the preferred alternative, limits water withdrawal to 15% of the under-ice volume for lakes deeper than 7 feet and up to 30% for lakes containing only ninespine stickleback and/or Alaska blackfish. See Required Operating Procedure 8-2. ***(Comment No.* 197620-085)**

The text has been revised in sections 4.4.4 and 4.5.4 to note that water withdrawal up to 30% of under-ice volume can occur in deeper lakes containing only ninespine stickleback and/or Alaska blackfish.

Comment From: State of Alaska (Comment Letter No. 197620)

Chapter 4, Environmental Consequences, Alternative C, Section 4.5.4, Water Resources, Effects of Disturbance, Ice Roadpad Water Use. Page 4-269. This paragraph incorrectly states the under-ice water withdrawal conditions for this alternative. This alternative, as with the preferred alternative, limits water withdrawal to 15% of the under-ice volume for lakes deeper than 7 feet and up to 30% for lakes containing only ninespine stickleback and/or Alaska blackfish. See Required Operating Procedure B-2. ***(Comment No.* 197620-093)**

Response To: Comment 197620-093

See response to comment 197620-085 under Water Withdrawal

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

Clean Water Act and Wetlands. The Draft EIS lacks sufficient detail to determine potential impacts to water bodies, shoreline vegetation and habitat, and wetlands from water use and withdrawal. The environmental consequences of water withdrawal from not only oil ad gas exploration activities but also reasonably expected future development and production should be presented and analyzed in the document. This is especially critical in areas with documented fisheries and waterfowl use. EPA recommends additional information be provided for the Preferred Alternative that addresses reasonably expected future maximum water withdrawal needs, locations of potential water withdrawal, the environmental consequences, and the effectiveness of mitigation measures included in the Preferred Alternative. ***(Comment No.* 197632-043)**

Response To: Comment 197632-043

The hypothetical development scenarios do address expected water withdrawal. When and if a discovery is made that can be economically developed and an actual development is proposed, we will be able to more definitively address water withdrawal issues.

TOPIC: WELL DRILLING

Comment From: Joe Gutshall (Comment Letter No. 191222)

Requirements for drilling should be very strict. ***(Comment No.* 191222-003)**

Response To: Comment 191222-003

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Joe Gutshall (Comment Letter No. 191222)

I feel that the requirements for drilling in this area should be very high and the fines for not complying should make it impossible to break the requirements and continue to do business. The requirements should protect the wilderness and insure that it would be impossible to have negative impact on the environment. The enforcement of these rules should be accomplished by special agents from the Native American culture centers and should be untouchable from any other entity. ***(Comment No.* 191222-004)**

Response To: Comment 191222-004

The BLM considered your comments during the development of the Final Proposed Action.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Interestingly, the Amended Draft EIS continues to identify extended reach drilling technology as a technological advance.31 During scoping, we were told that extended reach drilling technology had limited application in the Northeast NPR-A due to subsurface geology.32 Supposedly, because this limitation on the use of directional drilling was not discovered until after exploratory drilling in the No-Surface Occupancy zones in the eastern part of the Northeast NPR-A, this limitation was part of the reason for amending the 1998 NE NPR-A EIS/IAP. However, there is no mention of a technical limitation on extended reach drilling in the Amended Draft EIS,33 and the zones where exploratory drilling has occurred remain intact under both Alternatives B and C (although other No-Surface Occupancy zones would be obliterated.)34 Unless we've missed something, it appears that limitations on extended reach drilling is yet another justification for this process which the BLM is no longer advancing.35 **(Comment No. 197616-032)**

Response To: Comment 197616-032

Extended reach drilling is an evolving technology whose capabilities are dependent on project-specific geology. Well cost is another main consideration because companies will not drill overly expensive wells even if they are capable of doing so. At the present time on the North Slope, the capability of extended reach drilling is approximately 4 miles under ideal geologic conditions. For the difficult geology under the Fish Creek area in NE NPRA, the capability is much less than 4 miles. At this time, other areas of difficult geology have not been identified. A clear distinction should be made between exploration drilling and production well drilling. Exploration drilling into unknown subsurface conditions normally does not use extended reach wells. The most efficient wells from both a cost and data collection standpoint are vertical wells. Extended reach drilling is usually employed for production wells used to reach portions of oil pools under no-surface-occupancy areas where surface drilling pads are not allowed. Certain areas in NE NPRA require special mitigation measures. No-surface-occupancy restrictions in one area may not be appropriate for another area. BLM has chosen to employ performance-based regulations to project-specific issues rather than continuing with broadly applied prescriptive regulations. This will afford better protection for biological and cultural resources while allowing more efficient oil and gas operations.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

Amended Draft EIS p. 4-36 notes that while oil beneath No-Surface Occupancy zones may be technically recoverable, "In most cases, the surface restrictions that would require directional drilling beyond 1 mile would cause economic burdens that would result in bypassed resource recovery or the elimination of marginal projects." There is nothing indicating that the economic burdens of directional drilling beyond a mile was not known at the time that the 1998 NE NPR-A EIS was finalized. **(Comment No. 197616-034)**

Response To: Comment 197616-034

We do not contend otherwise.

Comment From: Kuukpik Corporation (Comment Letter No. 197616)

The No-Surface Occupancy zones that would remain under Alternatives B and C would be subject to an exception clause that erodes the effectiveness of setting such areas aside. This letter will address the exceptions clause proposed for Alternatives B and C in section III below. **(Comment No. 197616-035)**

Response To: Comment 197616-035

See response to comment 196407-037 under topic Stipulations and ROPs.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Development and Production- Well Drilling. The assumptions given for extended-reach wells document a number of limitations that cast into doubt the likelihood that the best available technology will actually be used for field development. In fact the draft IAP/EIS at 4-36 argues that no surface occupancy restrictions will reduce industry interest since "directional drilling beyond one mile would cause economic burdens." Furthermore, the draft Amended IAP/EIS has dropped an important stipulation from the 1998 ROD related to this issue, Stip 32. Lessees shall use maximum economically feasible extended-reach drilling for production drilling to minimize the number of pads and the network of roads between pads. ***(Comment No.* 197617-049)**

Response To: Comment 197617-049

If no surface occupancy restrictions create unacceptable economic burdens the result will be a lack of industry interest in the particular lease tract (and no sale). On the other hand, if a lease is sold and a discovery made in an area covered by a no surface occupancy restriction it is hard to imagine the lease holder not using the most economically feasible extended reach drilling technology to maximize the amount of recoverable oil and resulting profits.

TOPIC: WETLANDS

Comment From: Steven Mueller (Comment Letter No. 033673)

I am especially concerned about the impact the Bureau of Land Management's proposal would have on the area around Teshekpuk Lake. It is unique and is an important wetlands in the Arctic needing protection from development. ***(Comment No.* 033673-002)**

Response To: Comment 033673-002

Teshekpuk lake is a very important wetland area for fish and wildlife. Stipulations and Required Operating Procedures are designed to mitigate and minimize impacts to wetlands, and the species inhabiting them.

Comment From: Raymond Wager (Comment Letter No. 149036)

It is a well documented fact that wetlands are essential to the health of our physical environment as well as its living creatures. In spite of its proclaimed "no net loss" of wetlands there is an on going net loss simply because man cannot make a wetland. It is a process of natural evolution. ***(Comment No.* 149036-002)**

Response To: Comment 149036-002

Wetland loss, potential for reclamation, and functional values are key considerations in determining where oil and gas developments are allowed.

Comment From: Central Sierra Environmental Resource Center (Comment Letter No. 196940)

Our Center is concerned by the proposals to reduce the size of the Teshekpuk Lake Surface Protection Area and to allow oil development in a large portion of this area. This area is one of the most important wetlands complexes in the circumpolar Arctic, and is an area of international ecological importance where exploration is inappropriate. The cumulative impacts on waterfowl and caribou due to increased disturbance, displacement and predation resulting from the oilfield development would imperil these wildlife populations. ***(Comment No.* 196940-001)**

Response To: Comment 196940-001

See response to comment 033673-002 under Wetlands

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Industrial development in breeding habitats may result in wetland loss or changes due to drainage, impoundment, changes in permafrost, or disturbance (BP 2001; Balogh, pers. communication 2002). One area of relatively high nesting density west of Teshekpuk Lake is already leased while the highest density nesting habitat occurs in the Teshekpuk Lake Surface Protection Area currently unavailable for leasing (BLM 1998). We are unaware of new scientific studies that suggest leasing could occur in this area without placing waterbirds, including spectacled eiders, at risk. ***(Comment No.* 197610-087)**

Response To: Comment 197610-087

The Final IAP/EIS indicates that development in the area around Teshekpuk Lake could result in a disproportionate increase in wetland vegetation classes being impacted. Potential impacts to waterbirds are also discussed in the Final IAP/EIS.

Comment From: Environmental Protection Agency (Comment Letter No. 197632)

EPA recommends revising the paragraph in Section 4.6.4.3 (Environmental Consequences, Wetlands and Floodplains), which references a Memorandum of Agreement between the USEPA and the U.S. Army Corps of Engineers (USACE), as follows (revised text is italicized): "Wetland impact are mitigated through stipulations, ROPs, permits and approvals issued at the exploration and development stages, ad under Section 404 of the Clean Water Act, administered by the USACE. The objective of mitigation for unavoidable impacts is to offset environmental losses. Under a Memorandum of Agreement between the USEPA and USACE, it is recognized that in certain areas such as the North Slope, avoidance or compensatory mitigation may not be practical due to the high proportion of land that is wetlands. The USEPA and USACE are working with industry to develop alternate methods to satisfy necessary compensation requirements for loss of wetlands on the North Slope." ***(Comment No.* 197632-044)**

Response To: Comment 197632-044

The statement referencing a Memorandum of Agreement between the U.S. Environmental Protection Agency and U.S. Army Corps of Engineers has been added to Section 4.6.4.3.

TOPIC: WILD AND SCENIC RIVERS

Comment From: Environmental Coalition (Comment Letter No. 197617)

Wild and Scenic Rivers Recognizing the importance of rivers to every aspect of public land values, the Wild and Scenic Rivers Act requires the BLM, as part of its land use planning duties, to consider whether the rivers under its jurisdiction qualify for inclusion in the Wild and Scenic Rivers System. 16 U.S.C. § 1276(d). The agency must consider all stream segments under its jurisdiction and must recognize that all free-flowing rivers and streams with outstandingly remarkable values are eligible for Wild and Scenic River designation. ***(Comment No.* 197617-126)**

Response To: Comment 197617-126

Wild and Scenic Rivers inventories were conducted on two previous occasions, as noted and referenced in Section 3.4.6.3 of the Draft Amended IAP/EIS. The results precluded designation as explained in Section 3.4.6.3.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS recognizes that the Colville River is eligible for designation as a Wild and Scenic River yet the draft IAP/EIS fails to provide the protection mandated by the Act. The draft IAP/EIS must adequately evaluate the adverse impact of roads, pipelines, seismic work and gravel extraction to the future designation of the Colville River. Contrary

to the 1998 ROD, the draft IAP/EIS authorizes exploratory drilling (Lease Stipulation D-2) in the river bed itself without any impact analysis or scientific rationale. The 1998 ROD only authorized an exception if drilling in the river bed was environmentally preferable not simply more feasible. ***(Comment No. 197617-127)***

Response To: Comment 197617-127

As directed by the Wild and Scenic Rivers Act of 1968, BLM took an initial look at the potential wild, scenic, and recreational rivers in the National Petroleum Reserve – Alaska. During the preparation of the 1998 Northeast National Petroleum Reserve IAP/EIS, the BLM reviewed the "outstandingly remarkable values" of the rivers in the Northeast Planning Area of the Petroleum Reserve and addresses the eligibility and suitable of the rivers. The Record of Decision made suitable determinations for all rivers identified as eligible; the BLM forwarded no recommendations to Congress for consideration for designation. The Northwest National Petroleum Reserve-Alaska IAP/EIS completed the river study by making suitability determinations for all rivers in the Northwest Planning Area. The Record of Decision made suitable determinations for all rivers identified as eligible; the BLM forwarded no recommendations to Congress for consideration for designation. The IAP/EIS's for the Northeast and Northwest Planning Areas of the Petroleum Reserve evaluated the potential adverse impacts of roads, pipelines, seismic work and gravel extraction to the future designation of rivers in these areas. The analyses did not identify any particular threat to the outstandingly remarkable values of the eligible rivers over the planning timeframe. The BLM is mandated to manage activities in the Petroleum Reserve to assure maximum protection of identified surface values to the extent consistent with the requirements of the Naval Petroleum Reserve Production Act. The development and refinement of measures to protect unique cultural, natural, fish and wildlife, and scenic and historical values is an ongoing process that does not end with this NEPA process or with adoption of an Integrated Activity Plan. The BLM will prepare detailed site-specific environmental analyses of any proposed exploration drilling or development activities. At that time, proposal-specific, project-specific mitigation measures will be developed to minimize adverse impacts to the physical,

Comment From: John. R. Swanson (Comment Letter No. 197633)

I oppose all oil and gas development plans in this area as all development plans are designed to destroy this area. I urge that the greater Teshekpuk Lake area be established as a National Park. To save this areas outstanding scenic and wildlife attributes and to promote fish conservation, as well as, caribou preservation so designate the entire Colville River Area as a National Wild River; as this river is unique, varied and fragile; an American heritage area. I designate the National Petroleum Reserve - Alaska Wilderness of 22,997,706 acres. This plan appears to violate the Endangered Species Act, and the Clean Water Act. ***(Comment No. 197633-001)***

Response To: Comment 197633-001

Although section 603 of the Federal Land Policy and Management Act (FLPMA) directed BLM to inventory all BLM lands for their wilderness values to the extent allowed for in the recommendations for wilderness designation, BLM lands in Alaska were exempted from this mandate. The Alaska National Interest Lands Conservation Act (ANILCA) directed the Secretary of the Interior to review BLM lands in Alaska "other than lands included in the National Petroleum Reserve-Alaska" for their suitability or non-suitability for preservation as wilderness. Section 1320 of ANILCA makes wilderness reviews discretionary on BLM-managed lands in Alaska. The BLM has exercised this discretion in striving to balance the requirement to implement the President's National Energy Policy to expedite oil and gas leasing and development with the need to protect resources. The BLM has decided not to recommend large portions of the National Petroleum Reserve-Alaska for addition to the wilderness system because such action would fail to meet the management purposes and objectives of this planning effort for the Northeast National Petroleum Reserve-Alaska. The BLM has decided to specifically not consider wilderness recommendation for lands in the Petroleum Reserve deemed to have high oil and gas potential. Designation of an area as a Special Area recognizes that significant surface resources are present and that during oil and gas exploration, the area should be managed to assure maximum protection of identified surface values to the extent consistent with the requirements of the Naval Petroleum Reserve Production Act. Also, as required under Section 7 of the Endangered Species Act, BLM is consulting with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to assure protection of listed species and their critical habitats. The BLM has considered your comments in developing the Final Preferred Alternative.

TOPIC: WILDERNESS AREAS

Comment From: Environmental Coalition (Comment Letter No. 197617)

BLM states the purpose of the draft IAP/EIS is to meet the agency's management responsibilities. This purpose is much broader than simply determining the appropriate parameters of an oil and gas leasing program. Consistent with this broad purpose, BLM must consider wilderness as a resource in all of the Planning Area and include wilderness in a range of reasonable alternatives. ***(Comment No. 197617-122)***

Response To: Comment 197617-122

Although section 603 of the Federal Land Policy and Management Act (FLPMA) directed BLM to inventory all BLM lands for their wilderness values to the extent allowed for in the recommendations for wilderness designation, BLM lands in Alaska were exempted from this mandate. The Alaska National Interest Lands Conservation Act (ANILCA) directed the Secretary of the Interior to review BLM lands in Alaska "other than lands included in the National Petroleum Reserve-Alaska" for their suitability or non-suitability for preservation as wilderness. Section 1320 of ANILCA makes wilderness reviews discretionary on BLM-managed lands in Alaska. The BLM has exercised this discretion in striving to balance the requirement to implement the President's National Energy Policy to expedite oil and gas leasing and development with the need to protect resources. The BLM has decided not to recommend large portions of the National Petroleum Reserve-Alaska for addition to the wilderness system because such action would fail to meet the management purposes and objectives of this planning effort for the Northeast National Petroleum Reserve-Alaska. The BLM has decided to specifically not consider wilderness recommendation for lands in the Petroleum Reserve deemed to have high oil and gas potential. Section 102 of the Federal Land Policy and Management Act (FLPMA) requires that BLM manage all of its lands from a multiple-use perspective. Oil and gas leasing is a legitimate use of BLM-managed lands and a specific use designated for the National Petroleum Reserve-Alaska since it was established in 1923. The 1998 Northeast National Petroleum Reserve-Alaska IAP/EIS addressed the issues of wilderness, wild and scenic rivers, special areas, visual resource management, and travel management in addition to oil and gas leasing and mitigation measures to protect surface resources.

Comment From: Environmental Coalition (Comment Letter No. 197617)

Even if BLM chooses not to recommend designation of any wilderness study areas within the Planning Area, NEPA requires BLM inventory all of resource values in the Planning Area including wilderness. Secondly, NEPA requires BLM analyze the impacts to wilderness values of oil and gas development for the entire affected environment. The draft IAP/EIS fails to adequately describe the wilderness resource or analyze the adverse impacts of oil and gas leasing on wilderness resources. The draft IAP/EIS asserts that opening 96% of the Northeast Planning Area to oil and gas development will only impact 6% of the wilderness resource values (draft IAP/EIS at 4-237). If the majority of the Planning Area qualifies as suitable wilderness (Department of Interior [DOI] 1979) then how could only 6% of the resource value be impacted? ***(Comment No. 197617-124)***

Response To: Comment 197617-124

A wilderness inventory was previously conducted in 2001, as noted and referenced in Section 3.4.6.2 of the Draft Amended IAP/EIS. The percentages of lost wilderness potential are based on the assumptions about the acreage of disturbance expected from the various alternatives.

Comment From: Environmental Coalition (Comment Letter No. 197617)

The draft IAP/EIS violated NEPA because it fails to consider as reasonable alternative, potential wilderness designations in the Northeastern portion of the planning area. "The creation of wilderness is a reasonable alternative." Sierra Club v. Lyons, No. J00-0009-CV (D. Alaska March 30, 2001) (holding that Forest Service violated NEPA when it failed to consider new wilderness recommendations in Forest Plan). Wilderness is a reasonable use that should be considered. We urge BLM to adhere to the intent of Section 1320 of ANILCA, and to ascertain the

full extent of the Planning Area's wilderness resource values and to complete an adequate impacts analysis of all of the suitable wilderness lands. ***(Comment No.* 197617-125)**

Response To: Comment 197617-125

Although section 603 of the Federal Land Policy and Management Act (FLPMA) directed BLM to inventory all BLM lands for their wilderness values to the extent allowed for in the recommendations for wilderness designation, BLM lands in Alaska were exempted from this mandate. The Alaska National Interest Lands Conservation Act (ANILCA) directed the Secretary of the Interior to review BLM lands in Alaska "other than lands included in the National Petroleum Reserve-Alaska" for their suitability or non-suitability for preservation as wilderness. Section 1320 of ANILCA makes wilderness reviews discretionary on BLM-managed lands in Alaska. The BLM has exercised this discretion in striving to balance the requirement to implement the President's National Energy Policy to expedite oil and gas leasing and development with the need to protect resources. The BLM has decided not to recommend large portions of the National Petroleum Reserve-Alaska for addition to the wilderness system because such action would fail to meet the management purposes and objectives of this planning effort for the Northeast National Petroleum

TOPIC: WILDLIFE AND ECOLOGY

Comment From: Thomas Matthews (Comment Letter No. 116072)

My concerns with selecting either Alternative B or Alternative C are: Scientific evidence indicates that significant impacts could occur to fish and wildlife if more of this area is opened to oil development. Teshekpuk Lake and its surrounding wetlands is a vital tundra-wetland complex in the circumpolar Arctic that is home to thousands of waterfowl and caribou. Tens of thousands of birds, including brant, greater white-fronted geese, Canada and Snow geese gather in the Teshekpuk wetland system to molt their flight feathers and are thus vulnerable to human disturbances. ***(Comment No.* 116072-003)**

Response To: Comment 116072-003

The Teshekpuk Lake Area is very important to many organisms. The IAP/EIS describes potential impacts from oil and gas development should it occur in this area and establishes various stipulations and Required Operating Procedures to mitigate impacts. These regulations will minimize impacts to fish and wildlife in the region.

Comment From: Steven DeCaluwe (Comment Letter No. 138143)

I urge you to adopt Alternative A, the "No Action" alternative, because it would maintain protection for the entire Teshekpuk Lake Surface Protection Area. The research done since opening portions of the eastern reserve to drilling all points toward an alarming impact on that region's fish and wildlife. ***(Comment No.* 138143-002)**

Response To: Comment 138143-002

See response to comment 116072-003 under Wildlife and Ecology

Comment From: Kurt Schwarz (Comment Letter No. 182845)

Teshekpuk Lake and its surrounding wetlands complex is a very important part of that great wildlife region. Notable birds of Teshekpuk Lake include large populations of four species of geese which congregate there in the molting season and crucial nesting populations of Spectacled Eider, Yellow-billed Loon, Red-throated Loon, Long-tailed Duck, King Eider, and Buff-breasted Sandpiper. The Teshekpuk Lake caribou herd, 45,000 strong, has its calving area near the lake, then uses different areas there for insect relief after calving. We do not believe the wildlife can survive if oil and gas activities are allowed in the area. ***(Comment No.* 182845-003)**

Response To: Comment 182845-003

See response to comment 116072-003 under Wildlife and Ecology

Comment From: Kurt Schwarz (Comment Letter No. 182845)

The North Slope of Alaska has rightly been described as "America's Serengeti." Teshekpuk Lake and its surrounding wetlands complex is a very important part of that great wildlife region. Notable birds of Teshekpuk Lake include large populations of four species of geese which congregate there in the molting season and crucial nesting populations of Spectacled Eider, Yellow-billed Loon, Red-throated Loon, Long-tailed Duck, King Eider, and Buff-breasted Sandpiper. The Teshekpuk Lake caribou herd, 45,000 strong, has its calving area near the lake, then uses different areas there for insect relief after calving. We do not believe the wildlife can survive if oil and gas activities are allowed in the area. ***(Comment No.* 182845-006)**

Response To: Comment 182845-006

See response to comment 116072-003 under Wildlife and Ecology

Comment From: Jim Thiele (Comment Letter No. 194429)

The entire Teshekpuk Lake area deserves protection. If I read the material correctly, your preferred alternative would reduce protection to 213,000 acres. That level of protection will not begin to protect the migratory birds, or the caribou ? I've seen first hand how much land they can traverse in a single day. The idea that I have heard put forth that there is some ?new science? that would indicate development would not have an impact seems particularly outrageous. The credible research I have seen clearly indicates that geese are highly sensitive to disturbance during the molt. And it shows that caribou that give birth to their young in this area are also at risk from the kind of disturbance your preferred alternative would permit. ***(Comment No.* 194429-002)**

Response To: Comment 194429-002

It is true that the area being considered is very important for caribou and the geese mentioned. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of molting geese and caribou to the potential impacts of oil development. In addition, it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: June Huyett Thomas (Comment Letter No. 195059)

This area has some of the most important natural resources in the entire circumpolar Arctic region: Wetlands with high-density water bird nesting and molting habitat for threatened waterfowl; Polar Bear denning habitat and grizzly bear feeding areas; Primary calving ground for the Western Artic Caribou Herd. Subsistence resources for Alaskan natives ***(Comment No.* 195059-007)**

Response To: Comment 195059-007

See response to comment 116072-003 under Wildlife and Ecology

Comment From: Elisabeth Lehigh (Comment Letter No. 195360)

Habitat fragmentation is one of the most disruptive and destructive human activities leading to the endangerment and extinction of wild animal populations. ***(Comment No.* 195360-002)**

Response To: Comment 195360-002

Habitat fragmentation is an important consideration for planning purposes in the NE NPRA. It has been important to decisions regarding areas of land that may be opened to oil and gas exploration and development and will be important in future permitting decisions regarding actual development.

Comment From: Kevin Witt (Comment Letter No. 195444)

The Teshekpuk (the-shek-puk) Lake region of America's Western Arctic offers unparalleled landscapes and abundant wildlife. From a vast network of coastal lagoons to deep lakes, wet sedge grass meadows and numerous river deltas, the area is prime habitat for caribou, lemmings, snowy owls, Arctic fox and the spectacled eider, a threatened sea duck. During the summer molting season, the region also supports as many as 60,000 geese, the largest concentration in the entire Arctic, and plays unimportant role in the Inupiat Eskimos' subsistence lifestyle. **(Comment No. 195444-002)**

Response To: Comment 195444-002

See response to comment 116072-003 under Wildlife and Ecology

Comment From: Ruth S. Sperling (Comment Letter No. 196041)

Polar bears and the Teshekpuk Lake Caribou Herd would also be impacted -- the habitat in this area is used by both species and is critical calving grounds for the Teshekpuk Lake Caribou Herd. **(Comment No. 196041-004)**

Response To: Comment 196041-004

The area is important habitat that supports large numbers of fish and wildlife as documented in the IAP/EIS. Stipulations and Required Operating Procedures are designed to limit impacts in areas where potential development may occur. Your comments were considered in developing the final Proposed Action.

Comment From: Ruth S. Sperling (Comment Letter No. 196041)

Wildlife scientists have already studied the effects of existing petroleum development on the North Slope -- there has been disruption of caribou herds and displacement to areas of poorer quality forage, even in newer oil fields that incorporate design features that allow the caribou to move more freely. Evaluation of resource development patterns in existing oil fields demonstrates the cumulative increase and interconnectedness of infrastructure and resulting fragmentation of tundra habitats. Habitat fragmentation is of special concern for species requiring large areas such as caribou, bears, and geese. **(Comment No. 196041-005)**

Response To: Comment 196041-005

See response to comment 195360-002 under Wildlife and Ecology

Comment From: Ruth S. Sperling (Comment Letter No. 196041)

I am concerned about impacts to habitats from the infrastructure of oil and gas exploration and petroleum development, such as:1. Loss of riparian habitats that are critical for a number of species. **(Comment No. 196041-006)**

Response To: Comment 196041-006

Setbacks established along rivers and streams in the NE NPRA should provide protection to riparian zones in the Planning Area.

Comment From: Ruth S. Sperling (Comment Letter No. 196041)

This area is important for long-term survival of very large numbers of species that live there and others that use the area during migration. ***(Comment No. 196041-009)***

See response to comment 116072-003 under Wildlife and Ecology

Comment From: Catherine Greenleaf (Comment Letter No. 196207)

The Teshekpuk (the-shek-puk) Lake region of America's Western Arctic offers unparalleled landscapes and abundant wildlife. From a vast network of coastal lagoons to deep lakes, wet sedge grass meadows and numerous river deltas, the area is prime habitat for caribou, lemmings, snowy owls, Arctic fox and the spectacled eider, a threatened sea duck. During the summer molting season, the region also supports as many as 60,000 geese, the largest concentration in the entire Arctic, and plays an important role in the Inupiat Eskimos' subsistence lifestyle. ***(Comment No. 196207-002)***

Response To: Comment 196207-002

See response to comment 116072-003 under Wildlife and Ecology

Comment From: George Ahmaogak, Mayor North Slope Borough (Comment Letter No. 196407)

Wildlife resources have also been affected by industrial facilities and operations, impacting the resources themselves and subsistence harvests. Caribou have been displaced from traditional calving, insect relief, and hunting areas. Ice road river crossings have restricted fish movement, and may have contributed to several years of poor fish harvests in Nuiqsut. Subsistence whaling has been impacted by barge traffic associated with onshore exploration. ***(Comment No. 196407-044)***

Response To: Comment 196407-044

Impacts from oil and gas development have occurred on the North Slope. Stipulations and Required Operating Procedures are designed to limit impacts to manageable levels.

Comment From: Steve Zack (Comment Letter No. 196561)

There are virtually no data from on-the-ground studies of wildlife, wildlife habitat needs, wildlife interactions, and demographic patterns in the NPR-A. Such information is critical to any realistic environmental assessment. Most all wildlife geographic and abundance patterns available are only from aerial surveys. There are no data for waterfowl or shorebirds, for example, which identify where 'source' and 'sink' demographic areas are. Further, there are no on-the-ground data to identify key regions of shorebird abundance, as this group is too small to reliably assess from aerial surveys. The paucity of on-the-ground studies means a critical dearth of needed ecological information concerning this diverse assemblage of species. ***(Comment No. 196561-010)***

Response To: Comment 196561-010

You are correct that most of the data regarding wildlife distributions in the NPRA are from aerial surveys. It is a very large area and in most cases aerial surveys provide the greatest amount of information and the greatest amount of coverage for the time and dollars available for the studies. Some organisms are more difficult to study from the air. Still aerial surveys provide appropriate data to look at large scale distributions of many bird and large mammal species. Additional on the ground studies would be required at each specific location before decisions regarding development were made. The entire North Slope is a "sink" demographic area for migratory waterfowl and shorebirds. "Source" areas would include all of the various species wintering grounds. Once nests are established there is relatively little demographic movement between areas except for movement to lagoons along the coast during staging before

migration. These patterns are fairly well identified for most species in the area. Nevertheless, some new information on shorebird distribution based on ground surveys was added to the Final IAP/EIS.

Comment From: The Nature Conservancy (Comment Letter No. 197609)

The current closures to leasing or surface activity, however, do not apply to large amounts of the breeding density areas for several waterfowl species, shorebirds, and Sabine's gull, or the places where the Teshekpuk Lake caribou concentrate for calving, summering, or wintering (please see table below). For example, only 53% of the calving area is represented in areas currently closed to leasing and/or surface activity. ***(Comment No. 197609-013)***

Response To: Comment 197609-013

The BLM considered your comments during the development of the Final Proposed Action.

TOPIC: WILDLIFE AND ECOLOGY

ISSUE: PREDATORY: PREY EFFECTS

Comment From: Kristi Espinoza (Comment Letter No. 118849)

Thousands of birds nest in this area because there are few natural predators (save for greedy corporate interests), including many threatened and endangered species. For example, the threatened spectacled eider listed under the Endangered Species Act nests in the area that the current proposal will demolish. These endangered and threatened species will also suffer from the increased number of predators, such as gulls, ravens and foxes that are attracted to oil fields. The entire ecosystem would be thrown out of balance. ***(Comment No. 118849-004)***

Response To: Comment 118849-004

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife including threatened eiders to the potential impacts of oil development. Specific regulations have been established to minimize the effects of increased predation pressure on tundra nesting birds. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Ann Dyes (Comment Letter No. 196944)

Tens of thousands of migrating birds depend on this undisturbed habitat for molting and breeding. Oil fields already established have shown that the resulting garbage attracts predators that are not common to the undisturbed preserve. These predators significantly reduce the chances for survival of baby birds in nests and molting geese which can't fly during the molt. ***(Comment No. 196944-002)***

Response To: Comment 196944-002

See response to comment 196942-006 under Birds - Molting Geese

Comment From: Ben Long (Comment Letter No. 196948)

Oilfields will attract predators who will prey on nesting birds and their eggs and young. Garbage will attract other wild animals such as bears who will also prey on the animals. But the impacts of the additional development on wildlife will be felt much farther than the Teshekpuk Lake area. This is because subsistence hunters as far away a the Yukon-Kuskokwim Delta and even in Mexico will have less Pacific brant to hunt as the species declines. ***(Comment No. 196948-003)***

Response To: Comment 196948-003

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife including threatened eiders to the potential impacts of oil development. Specific regulations require measures to minimize or eliminate the potential for increased predation on tundra nesting birds. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Arnie Schildhaus (Comment Letter No. 196950)

Negative impacts would include the disruption of the molting cycle for brant, greater white fronted geese, along with Canadian and snow geese. Caribou who seek relief in the area would likely be disturbed leading to higher herd mortality levels and resulting decreases in take for subsistence hunters in nearby native communities. Lastly, waste products from human activities in oil development areas attract predators that will prey on currently undisturbed habitats and species in the area. ***(Comment No. 196950-003)***

Response To: Comment 196950-003

The area under consideration is very important for waterfowl and other wildlife species including caribou. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife including molting geese to the potential impacts of oil development. Specific regulations require measures to minimize or eliminate the potential for increased predation on tundra nesting birds. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Direct effects of industrial development on the breeding grounds include disturbance by ground and air traffic, nest failure due to lake drawdown, toxic contamination, and vegetative disturbance on breeding lakes. Secondary effects—because of the availability of garbage— are increased predator populations, including glaucous gulls (Larus hyperboreus) (North and Ryan 1988) and parasitic jaegers (Stercorarius parasiticus) (Barr 1997, Johnson et al. 1996) and red (Vulpes fulva) and Arctic foxes (Alopex lagopus). An additional potential result of development is an increase in nest desertion subsequent to direct human disturbance (Gabrielson and Lincoln 1959, North 1994, Barr 1997, Fair 2002). ***(Comment No. 197610-078)***

Response To: Comment 197610-078

The Planning Area is very important for wildlife. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife to the potential impacts of oil development. Specific regulations require measures to minimize or eliminate the potential for increased predation on tundra nesting birds. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Nesting success may decline because of predation by Arctic foxes (Alopex lagopus), glaucous gulls (Larus hyperboreus), ravens (Corvus corax), and brown bears (Ursus arctos) (Sedinger and Stickney 2000, BP 2001). ***(Comment No. 197610-080)***

Response To: Comment 197610-080

See response to comment 196948-003 under Wildlife and Ecology - Predatory: Prey Effects

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Greater numbers of predators may occur in industrial areas due to anthropogenic sources of food and shelter provided at developed sites (Eberhardt et al. 1982, Martin 1997, Day 1998). The National Research Council (2003) also found that disposal of garbage in industrialized areas of the North Slope was inadequate to prevent attracting high densities of potential bird predators. ***(Comment No. 197610-081)***

Response To: Comment 197610-081

Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife including threatened eiders to the potential impacts of oil development. Specific regulations require measures to minimize or eliminate the potential for increased predation on tundra nesting birds. Recent studies have suggested that predator numbers remain stable in areas of development with proper handling of garbage. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: Audubon Alaska/National Wildlife Federation (Comment Letter No. 197610)

Furthermore, predation was the major cause of nest failure near Barrow (1997-2000), and high nest-failure rates may contribute to population decline and inhibit recovery (Obritschkewitsch et al. 2001). Increased predator numbers and predation is a recognized byproduct of oil exploration and development and may affect Steller's eiders where there is contact with oil fields (Martin 1997, Day 1998). ***(Comment No. 197610-090)***

Response To: Comment 197610-090

Steller's eiders nest in low densities in the Planning Area and it is important to protect this threatened species. Stipulations and Required Operating Procedures have been established for the various alternatives in an effort to reduce or eliminate the vulnerability of wildlife including threatened eiders to the potential impacts of oil development. Specific regulations require measures to minimize or eliminate the potential for increased predation on tundra nesting birds. In addition it is likely that pre-development studies will identify areas that may require special protection or areas important to species of concern.

Comment From: USFWS Fairbanks Field Office (Comment Letter No. 197618)

4.4.8.2, Page 4-206, Effects of Disturbances, Mortality: Despite the intent of ROP E-9, the Service does not concur that the potential effects to birds of increases in predators would be similar under the No Action Alternative and the draft Preferred Alternative (or for Alternative C). Although North Slope operators have, with the encouragement of the resource agencies, implemented measures to reduce the availability to predators of anthropogenic food sources and nesting or denning structures, these measures have not been completely effective, as evidenced by the continued nesting efforts of ravens on permanent and temporary structures and the persistence of unusually large concentrations of gulls associated with human activities. Because Alternatives B and C would open significantly more area, much of which supports important bird populations and habitats, to oil and gas leasing and development, increases in predators and related impacts to birds would likely be higher under these Alternatives than under the No Action Alternative. ***(Comment No. 197618-083)***

Response To: Comment 197618-083

The Final IAP/EIS has been revised in consideration of your comments. The following information was added to Section 4.4.8.2, Effects of Disturbances, Mortality, "Under the Preferred Alternative, there may be the potential for greater bird mortality due to predation than under the No Action Alternative if predators were attracted to development in areas of high bird use that are closed to leasing under the No Action Alternative A."

ACRONYMS, ABBREVIATIONS, AND SYMBOLS

AAAQS	Alaska Ambient Air Quality Standards
AAC	Alaska Administrative Code
AADT	Annual Average Daily Traffic (count)
ac	acre
ACI	Alaska Consultants, Inc.
ACIA	Arctic Climate Impact Assessment
ACMA	Alaska Coastal Management Act
ACMP	Alaska Coastal Management Program
ACP	Arctic Coastal Plain
AC&W	Aircraft Control and Warning
ADCED	Alaska Department of Community and Economic Development
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ADGC	Alaska Division of Governmental Coordination
ADNR	Alaska Department of Natural Resources
ADOL	Alaska Department of Labor
ADOLWD	Alaska Department of Labor and Workforce Development
ADOTPF	Alaska Department of Transportation and Public Facilities
ADR	Alaska Department of Revenue
AGL	Above Ground Level
AHRS	Alaska Heritage Resources Survey
ANCSA	Alaska Native Claims Settlement Act
ANGTS	Alaska Natural Gas Transportation System
ANILCA	Alaska National Interest Lands Conservation Act
ANS	Alaska North Slope; Arctic North Slope
ANWR	Arctic National Wildlife Refuge
AO	Authorized Officer
AOGCC	Alaska Oil and Gas Conservation Commission
AQRV	Air Quality Related Values
ARCO	Atlantic Richfield Company
ARL	Arctic Research Laboratory
AS	Alaska Statutes
ASDP	Alpine Satellite Development Project
ASRC	Arctic Slope Regional Corporation
ASTt	Arctic Small Tool tradition
BA	Biological Assessment
bbl	barrel
Bbbl	Billion barrels
BCBS	Bering-Chukchi-Beaufort Seas
BD/DR	Building Demolition and Debris Removal
BEA	Bureau of Economic Analysis
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BP	British Petroleum
BPXA	British Petroleum Exploration – Alaska
CAA	Clean Air Act
CAFF	Conservation of Arctic Flora and Fauna
CAH	Central Arctic Herd (of caribou)
CCP	Central Compressor Plant
CD	Colville Delta
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CIAP	Coastal Impact Assistance Program
CIP	Capital Improvement Project
CIRI	Cook Inlet Region Incorporated
cm	centimeter
CM	Cost of Mitigation
CMP	Coastal Management Program
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CPF	Central Production Facility
CRA	Circumpolar Research Associates
CRSA	Colville River Special Area
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DDT	Dicholorodiphenyltrichloroethane
DEW-Line	Distant Early Warning Line (System)
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPCA	Energy Policy and Conservation Act
ESA	Endangered Species Act
FEP	Full Economic Potential
FFD	Full Field Development
FLIR	Forward Looking Infrared Radar
FR	Federal Register
FLPMA	Federal Land Policy and Management Act
ft	foot/feet
FY	Fiscal Year
gal	gallon(s)
gal/day	gallons per day
GAO	U.S. General Accounting Office
GMU	Game Management Unit
GOR	Gas-to-Oil Ratio
GTL	Gas-to-Liquid Ratio
HRAF	Human Relations Area Files, Inc.

H_2S	Hydrogen Sulfide
IAI	Impact Assessment, Inc.
IAP	Integrated Activity Plan
ICAS	Iñupiat Community of the Arctic Slope
in	inch
IPCC	Intergovernmental Panel on Climate Change
IRA	Indian Reorganization Act
IRP	Industrial Roads Program
ISER	Institute of Social and Economic Research
km	kilometer(s)
km^2	square kilometer(s)
KOP	Key Observation Point
KRU	Kuparuk River Unit
LADS	Light Automated Drilling System
lb	pound(s)
LC_{50}	lethal dose at which half of the organisms die
LMR	Land Management Regulation
LNG	Liquid Natural Gas
LPG	Liquefied Petroleum Gas
LRR	Long Range Radar
LRRS	Long Range Radar Site
LUEA	Land Use Emphasis Area
m	meter(s)
m^2	square meter(s)
m^3	cubic meter(s)
Mcf	Thousand cubic feet (of gas)
Meq/l	Milliequivalents per liter
mg	milligram(s)
mg/l	milligrams per liter
mi	mile(s)
mi^2	square mile(s)
MMbbl	Million barrels (of oil)
MMbpd	Million barrels per day (of oil)
MMcfd	Million cubic feet per day (of gas)
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
Mpa	megapaseals
M-SFMCA	Magnuson-Stevens Fishery Management and Conservation Act
MOU	Memorandum of Understanding
MWD	Measurement while Drilling
NA	Not Applicable
NAAQS	National Ambient Air Quality Standard
NARL	Naval Arctic Research Laboratory
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO	Nitric Oxide
NO_x	Nitrogen Oxides
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NPR-A	National Petroleum Reserve-Alaska
NPRPA	Naval Petroleum Reserves Production Act
NRC	National Research Council
NRHP	National Register of Historic Places
NSB	North Slope Borough
NSBMC	North Slope Borough Municipal Code
NSMOG	North Slope Management Oversight Group
NSO	No Surface Occupancy
NSSI	North Slope Initiative
NWI	National Wetlands Inventory
NWS	Northern Warning System
O_3	Ozone
OCS	Outer Continental Shelf
OCSEAP	Outer Continental Shelf Environmental Assessment Program
OCSLA	Outer Continental Shelf Lands Act
OHA	Office of History and Archaeology
OHV	Off-highway Vehicle
ONR	Office of Naval Research
OPEC	Organization of the Petroleum Exporting Countries
ORV	Off-road Vehicle
OSC	On-scene Coordinator
OWM	Oil-weathering Model
PAH	Polycyclic Aromatic Hydrocarbons
PAI	Phillips Alaska, Inc.
PET-4	Naval Petroleum Reserve Number 4
pH	Measure of hydrogen ion concentration in the water
PL	Public Law
PM	Particulate Matter
$PM_{2.5}$	Particulate matter > 2.5 microns in diameter
PM_{10}	particulate matter > 10 micron in diameter
POL	Petroleum, Oil, and Lubricants
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act of 1976
RFSUNY	Research Foundation of the State University of New York
RI/FS	Remedial Investigation and Feasibility Study

RMP	Resource Management Plan
RMT	Research and Monitoring Team
RN	Roaded Natural
ROD	Record of Decision
ROP	Required Operating Procedure
ROS	Recreation Opportunity Spectrum
ROW	Right-of-Way
SAP	Subsistence Advisory Panel
SHPO	State Historic Preservation Officer
SO_x	Sulfur Oxides
SO_2	Sulfur Dioxide
SQRU	Scenic Quality Rating Unit
SPM	Semi Primitive Motorized
SRBA	Stephen R. Braund and Associates
SRP	Special Recreation Permit
SRR	Short Range Radar
SRRS	Short Range Radar Site
TAGS	Trans Alaska Gas System
TAPS	Trans-Alaska Pipeline System
TAPSO	Trans-Alaska Pipeline System Owners
Tcf	Trillion cubic feet (of gas)
TEA	Transportation Enhancement Act
TERA	Troy Ecological Research Associates
TLCH	Teshekpuk Lake Caribou Herd Area
TLH	Teshekpuk Lake Herd (of caribou)
TLUI	Traditional Land Use Inventory
TVD	True Vertical Depth
UAA	University of Alaska, Anchorage
UIC	Ukpeagvik Innpiat Corporation
UL	Unavailable for Leasing
USC	United States Code
USACE	U.S. Army Corps of Engineers
USDOC	U.S. Department of Commerce
USDOD	U.S. Department of Defense
USDOE	U.S. Department of Energy
USDOI	U.S. Department of Interior
USDOL	U.S. Department of Labor
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	Volatile Organic Compounds
VRM	Visual Resource Management
VSM	Vertical Support Member
WAC	White Alice Communications
WACS	White Alice Communication System
WAH	Western Arctic Herd (of caribou)
WSR	Wild and Scenic Rivers
WSRA	Wild and Scenic Rivers Act

yd	yard(s)
yd^3	cubic yard(s)
Y-K Delta	Yukon-Kuskokwim Delta
≥	greater than or equal to
≤	less than or equal to
>	greater than/more than
<	less than
$\mu g/m^3$	micrograms per cubic meter
°F	degrees Fahrenheit